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INFLUENZA STUDIES.

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II. FURTHER DATA ON THE CORRELATION OF EXPLOSIVENESS OF OUTBREAK OF THE 1918 EPIDEMIC.[1]

I. Introduction.

In the first of these Studies [2] it was shown that there was a definite and sensible net correlation between explosiveness of outbreak of the epidemic, as measured by an epidemicity index, and the normal death rate from certain organic and chronic diseases. Because of the importance of the subject it has been thought desirable to reexamine critically the data, making use of more refined quantitative measures of the several variables dealt with. It is the object of the present paper to give the results of this re-study of the problem. As before, the basic data are from the large American cities for which weekly data were furnished during the epidemic, by the Bureau of the Census.[3] There is now in progress in this laboratory an extended study of the same problems on the basis of data from the 96 great towns of England and Wales, as well as further studies on the American data.

Before taking up the detailed matters of the present study, I should like to call attention briefly to some methodological considerations which lie at the foundation of this and other papers in this series. It is hoped that in this way the nonmathematical reader may gain a more adequate conception of the real meaning of the results.

The most useful general method of acquiring knowledge of dynamic phenomena is unquestionably the experimental method. When we deal with phenomena of human biology, there is a wide range of matters in which the laboratory experimental method is, in the nature of the case, ruled out. Unfortunately, one can not breed homozygous strains of men at will for experimental purposes, nor subject them

[1] Papers from the Department of Biometry and Vital Statistics, School of Hygiene and Public Health, Johns Hopkins University, No. 21.

[2] Pearl, R., Influenza Studies. I. On Certain General Statistical Aspects of the 1918 Epidemic in American Cities: Public Health Reports, vol. 34, No. 32, pp. 1743-1783, 1919. Reprint No. 548, pp. 1-13. All citations in this paper are in terms of the pagination of the reprint.

[3] It is a pleasure to express my indebtedness, for help with the extremely laborious computation of multiple correlation coefficients used in this work, to my assistants Mr. John Rice Miner, Mrs. Charmian Howell, and Miss Agnes L. Bacon.

methodically to desired environmental conditions. In studying most problems of human biology resort must be had to some form of the statistical method. This is fundamentally a descriptive method, and hence in many of its phases is ill adapted to the analysis of dynamically active events. There is, however, one branch of the statistical calculus which offers certain methodological possibilities which I think have been generally overlooked. Let us consider this.

The essence of the experimental method, as practiced in the laboratory, and in theory, is that, of the multitude of variables conditioning a phenomenon, as many as possible are, by appropriate methods, held constant while one variable (or at most a very few selected variables) is allowed to vary and the results are noted. One may then deduce the relative significance of the selected variable in determining the phenomenon under observation. Now we frequently hear in scientific discussions about the experiments that Nature makes. Actually the true conditions of an experiment are rarely if ever realized in the course of natural events. It is just because Nature permits manifold and haphazard changes in *all* variables at the same time that recourse must be had to the method of experimental control in the laboratory. What is needed in order to interpret the results, in the experimental sense, and determine the meaning of the manifold and ceaseless changes and variations in the flow of naturally determined events, is some method of picking out of the manifold some selected *constant* conditions of a series of variables, and then measuring the extent and character of the variations in a *single* selected variable, whose true relative influence upon the phenomenon it is desired to know, while all these other variables are held constant. If this can be done we shall have realized all the epistemological advantages of the experimental method as practiced in the laboratory, and have freed ourselves at the same time from the limitations which in so many cases inhere in the material itself and make the laboratory type of experimental inquiry impossible. In other words, we shall have let Nature perform the experiment, in the sense of determining the phenomena, in her own way, while we evaluate the results in critically analytical terms of precisely the same sort and meaning as those in which we evaluate the results of a laboratory experiment.

Now exactly this epistemological boon is actually afforded in the method of partial or net correlation, if properly handled. This analytically simple, if geometrically complex, calculus enables one, out of a manifold complex of variables operating in an entirely uncontrolled and natural manner, to determine the variation of any selected single variable, or the correlation of any selected pair for *constant* conditions or values of the other variables in the complex. I judge that the epistemological possibilities of this method are not

yet fully grasped by scientific men generally. When they are I believe it will rank as a fundamental method of acquiring knowledge, combining certain of the advantages of the descriptive or historical and of the experimental methods. It seems to me much more effectively to justify Royce's [4] eulogy of the statistical method than any of the arguments which he advanced. The best elementary, but at the same time adequate, account of the method is that of Yule.[5]

The problem with which this paper has to do may be stated in this way: It is an obvious fact that the large American cities varied enormously among themselves in respect to the explosiveness of outbreak of epidemic mortality in the autumn of 1918. What factors, environmental or other, were significant in determining or influencing this variation? Or, put in another way, what factors of the numerous other respects in which these 34 large cities differ from one another can be shown to be significantly correlated with the observed differences in explosiveness of outbreak of epidemic mortality?

II. Variables Discussed.

The variable phenomena or attributes discussed in the present paper are listed below, together with the subscript numbers by which they will be designated in this and subsequent papers in this series.

Subscript No.	Variable.
1.	Explosiveness of outbreak of epidemic mortality as measured by an epidemicity index I_6.
3a.	Normal death rate from pulmonary tuberculosis.
3b.	Normal death rate from organic diseases of the heart.
3c.	Normal death rate from acute nephritis and Bright's disease.
3d.	Normal death rate from typhoid fever.
3e.	Normal death rate from cancer and other malignant tumors.
3f.	Normal death rate from all causes.
4.	Age distribution of population.
5.	Sex ratio of population.
6.	Density of population.
7.	Latitude.
8.	Longitude.
9.	Rate of growth of population, 1900–1910.

In the following paragraphs these variables are defined and discussed in detail.

1. In the first of these Studies a number of indices of explosiveness of outbreak of epidemic mortality were considered and the one finally adopted, I_5, was called the peak-time ratio and defined as follows:

$$I_5 = \frac{P - M'}{T},$$

[4] Royce, J., The Mechanical, the Historical, and the Statistical: Science, N. S. 1914.

[5] Yule, G. Udny, An Introduction to the Theory of Statistics, Fifth Edition, pp. 228–253, London, 1919.

where P denotes the maximum peak mortality rate observed during the duration, T, of the epidemic, which was defined as follows: "The epidemic mortality was considered to have begun in any city on the date when the mortality curve for that city first passed outside the range of fluctuation exhibited by the curve between the week ending July 6, 1918, and the end of the week immediately preceding the epidemic rise of the curve. The mortality of the first epidemic outbreak was considered to have ended on the date when the curve again passed within the same range of fluctuation." M' is the mean weekly annual death rate in the period from July 6, 1918, to the outbreak of the epidemic.

This index, I_5, increases as the explosiveness of the outbreak increases. After the publication of the paper, however, it was pointed out by Dr. W. H. Frost and Mr. Edgar Sydenstricker, of the United States Public Health Service, that it was open to some criticism as a measure of explosiveness of epidemic outbreak, in the strictest sense of the term. The point of criticism was that inasmuch as T included the whole time within which the mortality curve was outside the normal range, the value of the index would be influenced by both the ascending and descending limbs of the epidemic curve; whereas if it is strict explosiveness of *outbreak* that we wish to measure, only the ascending limb is of moment. Reflection shows that the point is well taken, and consequently in the present study we have used an index I_6, for which the symbolic expression is:

$$I_6 = \frac{P - M'}{T'}.$$

Here the letters have the same significance as before except that T' is the number of weeks elapsed between (a) the date when the mortality curve first passed outside the range of fluctuation exhibited by the curve between the week ended July 6, 1918, and the end of the week immediately preceding the epidemic rise of the curve, and (b) the week in which the mortality curve attained its first epidemic peak. In other words, there is now included in the epidemicity index only the ascending limb of the epidemic curve. As a matter of fact, in the American cities here dealt with, little practical difference is made in any conclusions regarding the epidemic whether one uses I_5 or I_6, but there can be no question that theoretically I_6 is the superior value, and consequently we have used it in this part and the following parts of these Studies.

2. The subscript 2 refers to total destructiveness of the epidemic, a variable not discussed in the present paper, but defined in the next following of these Studies.

3. The subscript 3 refers to a normal death rate in the community from one of the causes specified by letters. In the earlier study the

death rate of the community for a single year was taken as indicative of the normal for the purposes of that work. In the present study we have taken instead the mean annual death rate from each of the specified causes for the three years 1915, 1916, and 1917. It is beyond question that the three-year average will give a much more accurate representation of the prevailing normal rate of mortality from each of these diseases in the community just preceding the epidemic than will the rate for any single year.

4. Age distribution of the population. In the first of these Studies there was used, as a single numerical index of the age distribution, a quantity which measured the extent to which each city deviates in the age constitution of its population from a fixed standard, but did not tell the nature or kind of deviation. Since the publication of that paper there has been devised a new and more adequate index [6] of the age constitution of the population. We have adopted as an age-constitution index the function

$$\phi = S\left\{\frac{\Delta^2}{P}\right\}(M - M_p)$$

where Δ is the deviation for each of six age groups (viz, 0–4, 5–14, 15–24, 25–44, 45–64, 65 and over) of the percentage of the actual population of each city in 1910 in each age group, from the percentage in the same group in the standard population of Glover's [7] life table, denoted in the formula by P; S denotes summation of all six values; M = mean age of living population in any community; M_p = mean age of persons in a stationary population unaffected by migration and which, assuming the mortality rates of Glover's life table, would result if 100,000 persons were born alive uniformly throughout each year (M_p calculated from L_x line of Glover's table (p. 16), = 33.796 years).

This procedure simply multiplies our former index χ^2 by the difference (given its proper sign) between the mean age of the observed population and the mean age of the standard population on the basis of which χ^2 was calculated. Since, in fact, the mean age of any actual urban population is never likely to be as great as the mean age of the stationary population chosen as a standard of reference, the actual values of ϕ will practically always be negative for cities. The smaller these negative values are numerically, the greater will be the proportion of older persons in the population concerned. In short, this function ϕ tells us not only the degree to which a given population deviates in its age distribution from a fixed standard age distribution, but also the nature of this deviation, whether on the one hand in the direction of a relative excess of

[6] Cf. Pearl, R., On a Single Numerical Index of the Age Distribution of a Population: Proc. Nat. Acad. Sci., vol. 6, pp. 427-431, 1920.

[7] Glover, J. W., United States Life Tables, 1910, Bureau of the Census, 1916.

aged, or on the other hand in the direction of a relative excess of the young. Theoretically it is possible for two populations differing from one another in a compensatory way to give the same values for the index ϕ. But two populations which differ in age distribution in any fundamental respect which could affect appreciably crude death rates will, in all populations I have been able to test, give different values of ϕ, provided the age classification from which the function is calculated is finely enough divided.

5. As an index of the sex distribution of the population, the male sex ratio was expressed as the ratio of males to 100 females in 1910.

6. The density of population in each city was calculated from data furnished in the "Financial Statistics of Cities," issued annually by the Bureau of the Census, and was expressed as the number of persons per acre of land area within the legally defined limits of the city.

7 and 8. In the earlier study the geographical position of the cities was indicated by the linear distance of each from Boston, as measured on the map. This was recognized as a very rough approximation. The interest in having some measure, in a study of this kind, of geographical position is twofold: First, that which arises from purely epidemiological considerations, namely, as affording, in relation to time, an index of the rate of spread of an infectious epidemic disease from a primary focus; and secondly, the fact that geographical position, especially latitude, is a rough but on the whole fairly accurate index of general climatological conditions. It was decided to make the expression of geographical position more accurate in the present study, and consequently there were included as definite variables the latitude and longitude of each of the cities considered.

9. Rate of growth of population 1900–1910. The reason for the inclusion of this variable in the study was twofold. Primarily this may be taken as a rough but probably fairly accurate index of the degree of industrialization of a city. In general, those cities which are growing most rapidly in population are those in which the most rapid industrial development is taking place. It would be much better if the rate of growth of the population between 1910 and the outbreak of the epidemic could have been used; but accurate data are lacking, nor will they be available until the results of the 1920 census are published. Consequently this variable must be regarded as a rough approximation to one that we should like to measure more accurately, namely, the present state and recent rate of industrial development. In the second place, rate of growth is a definite biological characteristic of a population,[8] and as such

[8] *Cf.* Pearl, R., and Reed, L. J., On the Rate of Growth of the Population of the United States since 1790 and its Mathematical Representation: Proc. Nat. Acad. Sci., vol. 6, pp. 275–288, 1920.

worthy of inclusion in any study relating an epidemic disease to demographic conditions.

III. Data.

The actual data used in the correlations are given in Table 1. Since in other work it was desired to correlate destructiveness of the epidemic, as measured by the 25-week excess mortality, with the other variables, only 34 cities could be used, because only for that number are the excess mortality figures available.

TABLE 1.—*Data for correlation of characteristics of cities with explosiveness of epidemic influenza mortality.*

(The subscript numbers at the heads of columns correspond to the list of variables given on p. 275.)

City.	1.*	3a.	3b.	3c.	3d.	3e.	3f.	4.	5.	6.	7.*	8.	9.
Albany, N. Y	32.2	224.5	236.4	180.1	10.8	137.6	1,947.0	−10.73	92.9	8.89	42.65*	73.75*	6.5
Atlanta, Ga	5.3	113.9	121.6	159.2	19.5	66.5	1,551.2	−82.71	92.7	11.42	33.73	84.33	72.3
Baltimore, Md	43.4	202.7	195.9	179.0	18.1	107.5	1,819.3	−31.80	92.4	30.57	39.28	76.62	9.7
Boston, Mass	28.8	143.8	211.5	101.0	3.9	117.0	1,651.6	−31.05	96.7	27.36	42.36	71.06	19.6
Buffalo, N. Y	21.1	146.0	155.9	123.0	10.3	97.8	1,595.1	−48.61	100.6	18.97	42.88	78.92	20.2
Cambridge, Mass	17.9	178.8	183.9	73.6	2.7	118.8	1,354.4	−30.26	91.7	28.23	42.38	71.13	14.1
Chicago, Ill	13.2	139.5	150.1	110.4	4.1	88.8	1,457.1	−68.75	106.3	20.28	41.88	87.60	28.7
Cincinnati, Ohio	9.2	206.8	202.5	162.0	4.8	111.5	1,618.0	−22.93	95.4	9.10	38.14	84.42	11.6
Cleveland, Ohio	17.7	132.8	118.8	90.6	7.0	82.4	1,432.1	−74.51	103.6	20.08	41.50	81.70	46.9
Columbus, Ohio	11.0	131.8	155.2	88.0	11.4	105.1	1,498.3	−29.08	101.5	15.18	40.00	83.00	44.6
Dayton, Ohio	28.8	139.2	184.3	105.2	17.3	107.7	1,492.7	−24.10	101.9	12.65	39.73	84.18	36.6
Fall River, Mass	27.8	139.6	164.0	108.5	14.3	83.9	1,639.4	−73.39	93.4	5.91	41.70	71.15	13.8
Grand Rapids, Mich	2.5	75.3	143.1	94.7	19.0	98.4	1,258.8	−27.95	97.4	11.85	42.97	85.70	28.6
Indianapolis, Ind	8.6	164.2	185.7	111.1	17.1	95.3	1,550.2	−24.23	98.7	10.96	39.67	86.13	38.1
Louisville, Ky	21.5	160.1	161.7	160.1	14.2	83.5	1,542.1	−32.19	94.1	16.61	38.20	85.70	9.4
Los Angeles, Calif	10.0	182.1	155.0	103.8	4.7	103.5	1,238.2	−13.61	103.9	2.40	34.08	118.20	211.5
Lowell, Mass	24.7	112.5	157.7	90.7	11.2	79.8	1,681.9	−34.91	94.1	13.63	42.65	71.32	11.9
Milwaukee, Wis	4.9	82.4	100.7	73.7	8.8	85.3	1,214.4	−62.17	102.8	26.92	43.05	87.95	31.0
Minneapolis, Minn	4.1	120.4	114.4	101.3	6.5	93.8	1,189.4	−55.39	139.2	11.27	44.97	93.30	48.7
Nashville, Tenn	41.5	189.3	198.7	125.1	30.0	83.3	1,683.7	−18.32	89.6	10.11	36.15	86.80	36.5
Newark, N. J	14.1	151.0	148.3	157.1	4.3	88.5	1,412.2	−62.54	99.6	27.52	43.75	74.17	41.2
New Haven, Conn	11.1	103.6	185.4	125.1	13.0	112.1	1,669.0	−33.70	99.7	13.05	41.32	72.92	23.7
New Orleans, La	34.1	270.9	224.4	245.6	22.3	95.5	1,983.0	−52.44	92.8	2.95	29.97	90.08	18.1
New York, N. Y	12.8	169.5	165.3	128.3	4.6	85.0	1,384.7	−74.42	99.9	29.54	40.71	74.00	38.7
Oakland, Calif	15.1	98.7	187.6	87.7	4.4	94.2	1,082.8	−17.18	108.7	6.41	37.75	122.33	124.3
Philadelphia, Pa	47.9	169.9	203.5	178.3	6.9	97.6	1,630.1	−24.27	95.4	21.02	39.95	75.17	19.7
Pittsburgh, Pa	21.3	115.9	134.5	94.3	10.4	90.7	1,694.0	−71.77	105.1	22.81	40.43	80.03	18.2
Providence, R. I	14.0	133.3	152.8	130.2	6.4	99.1	1,527.0	−30.05	96.7	22.35	41.84	71.40	27.8
Rochester, N. Y	13.9	95.7	203.1	138.0	4.7	109.8	1,455.8	−26.62	98.7	18.62	43.13	77.85	34.2
St. Louis, Mo	5.4	132.2	141.3	171.9	8.1	97.3	1,458.0	−44.57	101.5	19.36	38.63	90.20	19.4
St. Paul, Minn	4.5	105.6	118.9	79.7	5.0	86.2	1,093.0	−68.95	108.6	7.10	44.87	93.08	31.7
San Francisco, Calif	25.4	170.0	257.2	132.5	5.7	138.0	1,546.5	−34.34	131.6	17.55	37.79	122.43	21.6
Toledo, Ohio	17.9	173.7	185.2	88.7	18.0	103.9	1,705.1	−33.21	101.1	10.91	41.77	83.55	27.8
Washington, D. C	30.7	185.5	235.1	175.2	12.7	110.5	1,795.6	−20.67	91.3	9.55	38.89	77.03	18.8

IV. Demographic and Environmental Correlation.

We come now to the consideration of the results. The net influence of the several demographic and environmental factors upon explosiveness of epidemic outbreak may be first considered. As we are obviously interested in getting at the *net* influence of each factor, such as age distribution of the population upon variation in the epidemicity index, while all the other factors for which we have data are held to constant values, we may pass at once to the fifth order correlation coefficients, without stopping for detailed consideration of the lower order coefficients leading to the final values. Such points as do need discussion in connection with these lower order coefficients will be brought out in connection with the fifth order results. The net

correlations between epidemicity index (subscript 1) and each of the six demographic and environmental factors taken one at a time, with the other five held constant, are exhibited in Table 2. It is to be understood in this, and all subsequent papers in this series, that subscript numbers to the right of the decimal point denote variables held constant, and subscript numbers to the left of the point denote the variables correlated. r is, of course, simply the conventional symbol of a correlation coefficient.

TABLE II.—*Net correlation of explosiveness of outbreak (I_6) with various demographic and environmental factors.*

Variable correlated with explosiveness (I_6).	r subscripts.	Coefficient.
Age distribution of population	14.56789	+0.281 ±0.107
Sex ratio of population	15.46789	−0.001 ±0.116
Density of population	16.45789	+0.099 ±0.115
Latitude of city	17.45689	−0.369 ±0.100
Longitude of city	18.45679	−0.085 ±0.115
Rate of growth of population, 1900-1910	19.45678	−0.288 ±0.106

Taking the several variables in order we note:

1. Explosiveness of outbreak of epidemic mortality can not be positively asserted to be significantly correlated with the age distribution of the population. The coefficient +0.281 is less than 3 times its probable error. The plus sign means, having regard to the method of calculating age indices explained above, that so far as there is any correlation, high values of the explosiveness index I_6 tended to be associated with populations having a higher proportion of *older* persons than the average. No one of the lower order correlations of explosiveness and age index had a value as much as 3 times its probable error. The highest coefficient in the series was the fourth order $r_{14\cdot(678)} = +0.300 \pm 0.105$. The zero order $r_{14} = +0.194 \pm 0.111$. All r_{14} correlations, whatever the secondary subscripts, within the group now under consideration, are positive. In the first of these studies (*loc. cit.*, p. 38) the explosiveness-age correlation of zero order, with the less exact age distribution index, was $r_{14} = -0.262 \pm 0.101$, again a value nearly but not quite certainly significant. With border line values such as these, one can only say that in cities constant in respect to sex ratio of population, density of population, position, and rate of recent growth of population, the age composition of the population may have a slight influence in determining explosiveness of outbreak of epidemic mortality, but at best the influence must be very small.

2. The sex ratio of the population is plainly not significantly correlated with epidemicity index. The fifth order coefficient has a value -0.001 ± 0.116, which is sensibly zero. This is an interesting example of how partial or net correlations may differ from total correla-

tions. The zero order coefficient between explosiveness (I_e) and sex ratio is $r_{15} = -0.307 \pm 0.105$. This is a probably significant value, but arises not from any direct relation of variables 1 and 5, but indirectly through the relation of both of these to the positional variables 7 and 8 (latitude and longitude). In the group of cities here dealt with there is a relatively high correlation between male sex ratio and longitude, and between sex ratio and latitude, when longitude is constant. These relations are shown in the following coefficients:

$r_{57} = +0.134 \pm 0.114$ (sex ratio and latitude).
$r_{58} = +0.678 \pm 0.062$ (sex ratio and longitude).
$r_{57\cdot8} = +0.607 \pm 0.073$ (sex ratio and latitude—longitude constant).
$r_{58\cdot7} = +0.808 \pm 0.040$ (sex ratio and longitude—latitude constant).

Because of the inverse and nearly equal correlations of epidemicity index with latitude and longitude, the sex-ratio correlation with epidemicity index is neutralized as soon as these other variables are brought into the system. Thus while we have $r_{15} = -0.307 \pm 0.105$, we get $r_{15\cdot78} = +0.023 \pm 0.116$, or practically zero. We may then safely conclude that the proportion of males (or of females) in the population of a city had no sensible direct influence in determining the explosiveness of outbreak of epidemic mortality.

3. The net fifth order correlation of explosiveness of outbreak of the epidemic mortality with density of population is again sensibly zero. This is true whatever the variables held constant within the group here discussed. The zero order coefficient is $r_{16} = +0.073 \pm 0.115$. Nowhere in the series does a coefficient having primary subscripts 16 rise to a value even approaching 3 times the probable error. This result, that density of population, which is the measure of urban crowding in this case, had nothing to do with determining the explosiveness of outbreak of the epidemic mortality, while surprising on grounds of purely *a priori* logic—always, by the way, most unsafe grounds—fully confirms with more critical data the result attained in the earlier study (*loc. cit.*, p. 36).

4. In the case of the correlation of explosiveness of outbreak of epidemic mortality with the latitude of the city, a very different result appears. The fifth order coefficient is $r_{17\cdot45689} = -0.369 \pm 0.100$. This is more than three times its probable error and is probably *statistically* significant; but before drawing any conclusions about its epidemiological significance we must critically look into its genesis. In the first place it must be noted that the 34 cities with which we are dealing are not scattered at random over the United States. All but three of them are either on or east of the Mississippi River. This distribution is well shown in the map exhibited as Figure 1.

Not only are the cities mostly in the eastern half of the country, but, what is more important, they nearly all fall in a fairly narrow northeast-southwest belt. How clearly this is so is shown by the

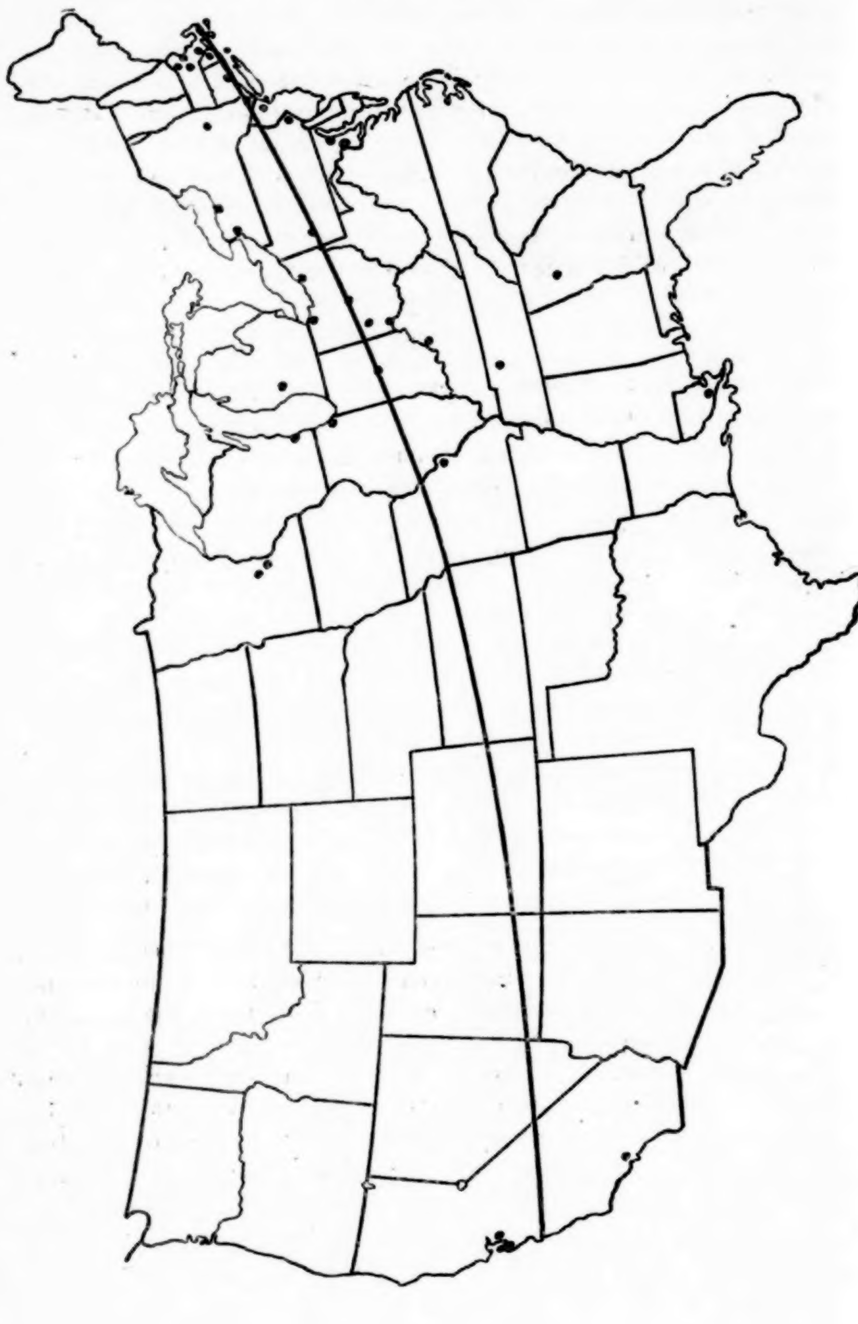

FIG. 1.—Outline map of the United States showing the location of the 31 cities used in this study.

regression of latitude on longitude, which is plotted on the map. The distribution of these cities is so far from random over the whole area of the country that there is a statistically significant correlation for these 34 cities, between latitude and longitude, the coefficient being $r_{78} = -0.404 \pm 0.097$. In words, what this means is that, within this group of 34 cities, in general, the farther north a city is the farther east it is.

Now, neither latitude nor longitude is alone significantly correlated with the epidemicity index I_6, as witness the zero order coefficients

$$r_{17} = -0.243 \pm 0.109$$
$$r_{18} = -0.229 \pm 0.110$$

But because of the relatively large value of r_{78} which has just been pointed out we get at once

$$r_{17.8} = -0.376 \pm 0.099 \text{ (significant)}$$
$$r_{18.7} = -0.369 \pm 0.100 \text{ (significant).}$$

The same influence makes itself felt throughout the series of ascending order partial coefficients. Thus, the relevant second order coefficients are:

$r_{17.45} = -0.208 \pm 0.111$	$r_{18.45} = -0.092 \pm 0.115$
$r_{17.46} = -0.303 \pm 0.105$	$r_{18.46} = -0.242 \pm 0.109$
$r_{17.48} = -0.387 \pm 0.098$	$r_{18.47} = -0.407 \pm 0.097$
$r_{17.49} = -0.407 \pm 0.097$	$r_{18.49} = -0.074 \pm 0.115$
$r_{17.56} = -0.264 \pm 0.108$	$r_{18.56} = +0.022 \pm 0.116$
$r_{17.58} = -0.319 \pm 0.104$	$r_{18.57} = -0.245 \pm 0.109$
$r_{17.59} = -0.358 \pm 0.101$	$r_{18.59} = +0.194 \pm 0.111$
$r_{17.68} = -0.381 \pm 0.099$	$r_{18.67} = -0.333 \pm 0.103$
$r_{17.69} = -0.403 \pm 0.097$	$r_{18.69} = -0.061 \pm 0.115$
$r_{17.89} = -0.421 \pm 0.095$	$r_{18.79} = -0.160 \pm 0.113$

It is at once evident that most of the r_{17} or latitude coefficients are three or more time their probable errors. Most of the r_{18}, or longitude coefficients are, on the contrary, less than three times their probable errors, the only ones arising to a higher value being those carrying 7 as a secondary subscript and not all of those. In other words, we come here to a separating point between the correlations carrying 1 and 7 as primary subscripts and those carrying 1 and 8 in the same position. This divergence comes about from the different correlations of certain of the other variables with latitude and longitude. Thus we have, for sex-ratio correlations, $r_{75} = +0.134 \pm 0.114$ against $r_{85} = +0.678 \pm 0.062$. Age distribution index is not significantly correlated with either latitude or longitude in this group of cities. Density is significantly and about equally correlated with both, the coefficients being $r_{86} = -0.424 \pm 0.095$, and $r_{76} = -0.371 \pm 0.100$. Rate of growth in this group of cities is nearly twice as highly correlated with

longitude as with latitude, the signs of course being opposite. The coefficients are $r_{79} = -0.365 \pm 0.100$ and $r_{89} = +0.642 \pm 0.068$.

Without pursuing this complex trail further, certain things are clear. In the first place it is evident that it will be quite unsafe to draw biostatistical or demographic conclusions about, or on the basis of data from, the large American cities, without having critical regard for the fact here demonstrated that some of the most important of these characteristics are significantly correlated with the mere geographical position of the cities. In the second place, because of this fact, we can not be quite sure of the epidemiological significance of the fact that, in this group of cities, there is a statistically significant negative correlation between epidemiological index and latitude. Taken at its face value this coefficient means that, on the average, the outbreak of epidemic mortality was *more* suddenly explosive, the farther *south* the city, when the other factors of age distribution, sex ratio, density, and rate of growth of population were constant and equal. Whether this bespeaks a real and general biological phenomenon resting presumably upon a climatological base can not be critically determined until we can study the matter in a group of localities distributed in a more random manner than in the present sample, so that the correlations between latitude and longitude shall be more nearly zero in value. It is interesting to note, however, that the present result in respect to latitude correlation is in accord with general clinical and pathological experience. I am told by Dr. William H. Welch that it has long been recognized by clinicians and pathologists that acute respiratory infections, and particularly the pneumonias, tend to become more fatal as one passes from north to south. There is a splendid chance here for a critical statistical investigation of the matter, and with the rapid extension of the registration area into the South in recent years, adequate data will shortly be available.

5. Rate of growth of population of these cities in the decade 1900 to 1910 is a factor connected with age of city, with its industrial and commercial prosperity and activity, and indirectly with sanitation, because usually in cities growing very rapidly, sanitary arrangements tend to lag behind the need for them. The net fifth order correlation of this variable with explosiveness of outbreak of epidemic mortality is $r_{19.45678} = -0.288 \pm 0.106$. This is a border-line value, which can not be safely asserted to differ significantly from zero. Roughly speaking, a value as large as this would turn up purely by chance about 7 times in every 100 trials with samples of the size here dealt with. The gross, zero order coefficient between these variables is $r_{19} = -0.302 \pm 0.105$, again not a significant value. No one of the partial coefficients having 1 and 9 as primary sub-

scripts is certainly significant in comparison with its probable error, except such as carry also 7 as a secondary subscript. On the whole, it can be safely asserted that if the rate at which a city had recently been growing in population had anything at all to do with the degree of explosiveness of outbreak of the 1918 epidemic mortality, this influence must have been at the most extremely slight.

6. In general, the results of this more extended and critical study of the influence of these demographic and environmental factors confirm the earlier preliminary examination of the data. The only variable in the lot that has a statistically significant net correlation with the explosiveness index is latitude. In the former study, use was made of linear distance from Boston as a locality index instead of the more general and exact latitude and longitude plan here adopted. But the correlation result obtained with the cruder variables was the same in sense, and of about the same order of magnitude as the more refined net fifth order latitude correlations. I have already indicated fully the wisdom of caution for the present in drawing biological conclusions from this latitude correlation. It is possible that the age distribution of the population and the rate of recent growth of the city had some slight influence upon the explosiveness of outbreak of the epidemic mortality; but in either case the effect must have been so slight as to be negligible so far as any practical epidemiological significance is concerned.

V. Death Rate Correlations.

We may turn now to another series of correlations. In the first study it was shown that the most significant correlations of explosiveness of outbreak of epidemic mortality were with the normal death rates from certain primarily organic diseases. These results, because of their novelty and possibly far-reaching theoretical significance, have been thought particularly to need critical reexamination. As has already been pointed out, we have in the present study taken the mean death rate for three years as indicative of normal conditions instead of a single year as in the earlier work.

The sixth order coefficients are exhibited in Table III. These coefficients measure the net correlation existing between the epidemicity index I_6 and the specified normal death rate, when the cities involved have been made constant and equal in respect to age and sex constitution of population, to density and rate of recent growth of population, and to latitude and longitude.

TABLE III.—*Net correlation of explosiveness of outbreak (I_6) with the normal death rates from certain specified causes.*

Variable correlated with explosiveness (I_6). Death rate from—	r subscripts.	Coefficient.
All causes	13f. 456789	+0.572 ±0.078
Pulmonary tuberculosis	13a. 456789	+0.389 ±0.098
Organic diseases of the heart	13b. 456789	+0.562 ±0.079
Acute nephritis and Bright's disease	13c. 456789	+0.307 ±0.105
Typhoid fever	13d. 456789	+0.105 ±0.114
Cancer and other malignant tumors	13e. 456789	+0.141 ±0.113

It is at once evident that these correlations are of a generally different order of magnitude from those of Table II. Specifically we note:

1. The highest correlation is that for the death rate from all causes; but that for organic diseases of the heart is practically identical. These coefficients are more than seven times the probable error and are certainly significant. The corresponding zero order coefficients are:

$$\text{All causes,} \quad r_{13f} = +0.678 \pm 0.063$$
$$\text{Organic heart,} \quad r_{13b} = +0.642 \pm 0.068$$

From these values, in comparison with those of Table III, it appears that by making all six demographic and environmental factors constant, the correlation between explosiveness and the normal death rate from all causes or that from organic diseases of the heart, is not altered to a degree statistically significant. This comparison indicates the overwhelming importance of the biological factor which these death rates measure in determining the explosiveness of the outbreak of epidemic mortality, as compared with the demographic and environmental factors previously considered.

2. Next to organic diseases of the heart, pulmonary tuberculosis is the single cause having its normal death rate most highly correlated with explosiveness of outbreak of the epidemic. The net sixth order coefficient for this disease, however, is distinctly lower than that for organic diseases of the heart. Furthermore it is much more reduced by the process of making demographic and environmental factors constant, as is indicated by the fact that the zero order coefficient for this disease is $r_{13a} = +0.578 \pm 0.077$. The difference between this and the sixth order coefficient $r_{13a \cdot 456789} = +0.389 \pm 0.098$ is 0.189 ± 0.125. While not statistically significant in comparison with the probable error, it comes much nearer being so than the corresponding difference for the organic heart correlation, which is 0.080 ± 0.104.

3. In the case of the normal death rate from breakdown of the kidneys (acute nephritis and Bright's disease) the sixth order net coefficient is on the border line of probable statistical significance,

having a value just under three times its probable error. Again the process of making the six demographic and environmental factors constant has materially reduced the correlation between the normal death rate from these diseases of the kidneys and the explosiveness of outbreak of epidemic mortality. The zero order correlation here is $r_{13c} = +0.447 \pm 0.093$. The difference between the zero order and the sixth order coefficients is 0.140.

4. Turning to diseases of wholly different etiology from those dealt with up to this point, namely, typhoid fever and cancer, the correlations between the normal death rate from these diseases and the explosiveness of outbreak of epidemic mortality are found to be of an entirely different order of magnitude. In neither case, typhoid or cancer, is the coefficient sensibly different from zero, having regard to its probable error. Clearly, whatever factors, biological or environmental, or both, are measured by these death rates can not have had any sensible influence in determining the suddenness with which the mortality curve rose during the influenza epidemic. It is generally held on good grounds that the typhoid death rate is an excellent index of the general sanitary status of a community. If it may be so accepted in the present connection, the result just stated bears out in precise mathematical terms what was obvious to the thoughtful and candid observer at the time of the epidemic, namely, that the severity with which a city was hit by the epidemic bore no relation to its general sanitary status or to the efficiency of its health organization. In this connection there is a further interesting mathematical point regarding the typhoid correlation. The zero order gross correlation for this death rate with I_6 is $r_{13d} = +0.342 \pm 0.102$. This is a statistically significant correlation; but observe that as we make the cities constant in respect to demographic and environmental factors the reduction in the correlation is very great, ending with the sixth order coefficient at a value $r_{13d.456789} = +0.105 \pm 0.114$, a drop of 0.237 in the coefficient. But this is exactly what would be expected when it is recalled to what an extent the typhoid death rate of a community depends upon the environmental conditions in that community.

5. The normal cancer death rate is not significantly correlated with the epidemicity at any stage, nor is the correlation altered to any extent by making the demographic and environmental factors constant. This is indicated by the fact that the zero order coefficient is $r_{13e} = +0.235 \pm 0.109$, while the sixth order coefficient is lower by only 0.094.

6. Taking all the results together they confirm, in general, but refine, those of the earlier study. It is now seen that a considerable part of the high correlation then found for the tuberculosis death rate with epidemicity index disappears if the cities are made constant and

equal in respect to some six important demographic and environmental factors. The correlation is still, however, in spite of the reduction, significant in comparison with its probable error. Death rate from all causes is highly correlated under all circumstances with explosiveness of outbreak. This death rate may be taken as an index of the general healthfulness of the community.[9] But the outstanding *single* factor, which apparently more than any other one thing yet discovered, determined how abruptly or explosively the mortality was to rise at the outbreak of the epidemic, was the normal death rate in the community from organic diseases of the heart. This extraordinary and striking fact will be more fully discussed in the next paper in this series.

VI. Summary.

In this second study a further more refined and detailed analysis is made of the weekly mortality statistics of the influenza epidemic of the autumn of 1918. Using the method of multiple or partial correlations the attempt is made to determine more critically the factors chiefly responsible for the great variation exhibited among 34 large American cities in respect to the degree of suddenness or explosiveness of outbreak of epidemic mortality. A new and more critically exact epidemicity index is described, as well as a more accurate single numerical index of the age distribution of a population. Every effort was made to get critical quantitative measures of the variables dealt with. In general, this more extended and refined study confirms the results of the first. It is believed that the critical refinements introduced in this and the succeeding studies fully meet the implied criticisms of Winslow and Rogers [10] on the first study, at least so far as concerns readers capable of understanding the implications of the theory of probability. It is, for example, simply idle to assert that a surely significant correlation between death rate from organic diseases of the heart and explosiveness of outbreak of influenza may be "due to peculiarities in age distribution of the population" when it is conclusively shown, as it here is, that the same correlation prevails *when the age distributions of all the populations concerned are held constant.* If the results of these studies are to be successfully controverted it must be upon a different basis than logic of this sort. Of the six environmental and demographic variables tested, only one, namely, the city's latitude, was found to have a statistically significant net correlation with the explosiveness or epidemicity index. In that case the biological or epidemiological significance of the result is doubtful, because of the peculiar non-

[9] It is so used, for example, by Brownlee, J., An Investigation into the Epidemiology of Phthisis in Great Britain and Ireland: Med. Res. Comm. Spec. Rept. Ser. No. 46, pp. 1-98, 1920.

[10] Winslow, C.-E. A., and Rogers, J. F., Statistics of the 1918 Epidemic of Influenza in Connecticut: Jour. Inf. Dis. vol. 26, pp. 184-216, 1920.

random spatial distribution of the 34 cities furnishing data. On the other hand, the normal death rate from all causes and from organic diseases of the heart are correlated to a relatively high degree with explosiveness of outbreak of epidemic mortality. The normal death rate from pulmonary tuberculosis is also sensibly, but not highly, correlated with explosiveness of influenza outbreak. The normal death rates from typhoid fever and from cancer show no sensible net correlation with explosiveness.

III. ON THE CORRELATION OF DESTRUCTIVENESS OF THE 1918 EPIDEMIC [11]

I. Introduction.

It was pointed out by friendly critics after the appearance of the first of these Studies [12] that the epidemiological character there dealt with was explosiveness of outbreak, as measured by an epidemicity index I_5 subsequently modified into I_6 as described in the second of these Studies [13], and that as explosiveness of outbreak of epidemic mortality was obviously a characteristic which might conceivably be nearly or quite distinct and independent from destructiveness as measured by the total number of persons killed by the epidemic, it was a matter of doubt what might be the real meaning of the biological conclusions flowing from the peculiar facts brought out in that first study, since confirmed and extended in the second. This criticism was well taken. The obvious answer to it, however, is to study destructiveness in the same way that we have explosiveness of outbreak, by the method of multiple correlation. It is the purpose of this paper to present the results of just such a study, in which the extended and critically defined series of variables of Influenza Studies II were used.

The problem to which this paper is addressed may then be stated in the following terms: The 34 large American cities for which we have available published weekly data, varied enormously among themselves in respect to the destructiveness of the epidemic, as measured by the number of their inhabitants who died in excess of the normal, during the autumn and winter of 1918–19. What factor significantly influenced or determined this variation?

The methods by which this problem is attacked in the present paper are precisely the same as those of the second of these Studies, and the reader is referred to the introductory portion of that paper for the general discussion of methods used.

[11] Papers from the Department of Biometry and Vital Statistics, School of Hygiene and Public Health, Johns Hopkins University. No. 22.

[12] Pearl, R., Influenza Studies. I. On Certain General Statistical Aspects of the 1918 Epidemic in American Cities: Public Health Reports, vol. 34, No. 32, pp. 1743-1783. 1919. Reprint No. 548, pp. 1-43. All citations in this paper are in terms of the pagination of the reprint.

[13] See p. 276.

II. Variables Discussed.

The variables discussed in the present paper are precisely the same as those listed in Influenza Studies II (p. 275) with two exceptions. These are (a) that here the variable I_6 (explosiveness of outbreak) is omitted, and (b) its place is taken by a new variable, destructiveness, which is indicated by the subscript 2 in all that follows. Destructiveness is measured by the 25-week excess mortality rates calculated and published by the Bureau of the Census.[11] These 25-week excess rates indicate the number of people dying from all causes, during the 25 weeks following the initial outbreak of the epidemic in this country in the autumn of 1918, in excess of the number who probably would have died in the same period had no epidemic occurred. The rates for the 34 cities are given in Table I (p. 12) of Influenza Studies I, and hence need not be reprinted here. The values of the other variables used in this paper are given in Table I of Influenza Studies II (p. 279).

III. Demographic and Environmental Correlations.

Just as in the discussion of explosiveness of outbreak, we may consider first the net fifth order correlations of destructiveness with the several demographic and environmental factors for which we have data. The coefficients are exhibited in Table I.

TABLE I.—*Net correlation of destructiveness (25-week excess mortality) with various demographic and environmental factors.*

Variable correlated with destructiveness (25-week excess mortality).	r subscripts.	Coefficient.
Age distribution of population	24.56789	+0.132±0.114
Sex ratio of population	25.46789	+0.161±0.113
Density of population	26.45789	+0.163±0.113
Latitude of city	27.45689	−0.424±0.095
Longitude of city	28.45679	−0.133±0.114
Rate of growth of population, 1900-1910	29.45678	−0.083±0.115

The results here are clear cut. The only variable having a net coefficient which can be regarded as sensibly different from zero is latitude. There the coefficient is certainly statistically significant. Taken at its face value, and remembering the significance of the negative sign, this means that the farther south the city the greater the rate of mortality in excess of the normal. Or put in another way, the coefficient indicates that the influenza epidemic had a definite, though at best not marked, tendency to be more destructive of life in southern than in northern latitudes. Too much stress must not be laid upon this result, however, because of the peculiar spatial distribution of this group of 34 cities. This point has been fully discussed in the preceding study of this series and need not be

[11] *Cf.* Public Health Reports, vol. 34, No. 11, p. 505, 1919.

dwelt on again here. The same reasons exist for suspending judgment as to the full biological significance of the apparently definite correlation between destructiveness of the epidemic and latitude, as were emphasized in the case of the similar correlation between explosiveness of outbreak and latitude.

The remaining coefficients are very definitely so small as to leave no doubt about their meaning. Throughout the long process of making more and more variables constant and getting the successive higher order net coefficients, no one of these demographic characters, except latitude, ever showed a value sensibly differing from zero. This fact is well indicated by the zero order coefficients, which are as follows:

$$r_{24} = +0.024 \pm 0.116 \text{ (age).}$$
$$r_{25} = -0.029 \pm 0.116 \text{ (sex).}$$
$$r_{26} = +0.111 \pm 0.114 \text{ (density).}$$
$$r_{27} = -0.325 \pm 0.103 \text{ (latitude).}$$
$$r_{28} = +0.0007 \pm 0.116 \text{ (longitude).}$$
$$r_{29} = -0.071 \pm 0.115 \text{ (growth).}$$

It can, then, be safely asserted that in the determination of the variation among these 34 large American cities in respect to the excess mortality due to the epidemic, the age and sex distribution of the population, its degree of crowding (not its rate of recent growth), or the distance of the city west from the Atlantic seaboard, played no appreciable part whatever. This conclusion is true whether all these factors were allowed to vary together, or whether, as in a laboratory experiment, one to five of them were held constant, while the net influence of one or more varying alone was tested.

Whether or not the same conclusion will hold generally for other cities of a different order of size, or for rural districts, remains to be shown by further work. But as to the facts for the 34 cities listed in Table I of the second of these Studies, there can be no doubt or argument.

IV. Death Rate Correlations.

Turning to the same set of normal death rate variables as were studied in connection with explosiveness we have the results set forth in Table II.

TABLE II.—*Net correlation of destructiveness (25-week excess mortality) with the normal death rate from certain specified causes.*

Variable correlated with destructiveness (25-week excess mortality). Death rate from—	r subscripts.	Coefficient.
All causes	23f. 453789	+0. 405±0. 097
Pulmonary tuberculosis	23a. 453789	+0. 279±0. 107
Organic diseases of the heart	23b. 453789	+0. 537±0. 082
Nephritis and Bright's disease	23c. 453789	−0. 098±0. 116
Typhoid fever	23d. 453789	−0. 138±0. 113
Cancer and other malignant tumors	23e. 453789	+0. 258±0. 107

From this table we note the following points:

1. Epidemic excess mortality is significantly correlated with the normal death rate from all causes in these cities. This is true in gross ($r_{23f} = +0.435 \pm 0.094$) and also when the environmental and demographic factors listed in Table 1 above are held constant, as in an experiment. In other words, the number of people dying during the epidemic in each of these 34 cities was determined to a significant, though not a high, degree by the usual mortality relations of the community, as indicated by the normal death rate from all causes. Cities which have normally a high death rate had also a relatively high mortality from the influenza epidemic, and *vice versa* those normally enjoying a relatively low mortality rate lost but relatively few persons in the epidemic. It is to be noted, however, that while the net coefficient $r_{23f.456789}$ has a value more than 4 times its probable error and therefore is to be regarded as certainly significant statistically, yet this correlation is lower than the corresponding one for explosiveness of outbreak and death rate from all causes (cf. Table III, Influenza Studies II). We have:

Explosiveness, $r_{13f.456789}$	$= +0.572 \pm 0.078$
Destructiveness, $r_{23f.456789}$	$= +0.405 \pm 0.097$
Difference	0.167 ± 0.124

While this difference is not significant in comparison with its probable error, nevertheless there is considerable probability that with a larger sample it would become so. It thus appears that the explosiveness of outbreak of the epidemic mortality was, perhaps, somewhat more influenced by the normal mortality rate of the community than was its total magnitude or destructiveness.

2. The total destructiveness of the epidemic is not significantly correlated with the normal death rate of the community from pulmonary tuberculosis when the important demographic and environmental factors listed in Table 1 are held constant. Here we come upon a distinct break between the two epidemiological characteristics, explosiveness and total destructiveness. The former is, and the latter is not, significantly correlated with the normal tuberculosis death rate. A difference of the same sense is evident in the zero order gross correlations, which are $r_{13a} = +0.578 \pm 0.077$ and $r_{23a} = +0.428 \pm 0.094$. Both of these gross values are more than 3 times the probable error, but owe a considerable portion of their high values, as is demonstrated by the sixth order coefficients, to intercorrelations with other variables.

3. The highest net correlation of destructiveness of the epidemic is with the normal death rate from organic diseases of the heart. When all of the demographic and environmental factors with which

we are dealing are held constant for these cities, we find a correlation of $+0.537 \pm 0.082$, a value nearly 7 times its probable error, between these two variables. The coefficient is higher than that for the normal death rate from all causes with destructiveness. It appears very clearly that of the 12 different factors here studied the normal death rate of the community from organic diseases of the heart had more to do with determining the proportionate part of the population which perished in the epidemic than any other factor. In those cities having normally a high heart-disease rate a relatively large number died in the influenza epidemic, and *vice versa*. The same thing was shown in the preceding study to be true for explosiveness of outbreak of epidemic mortality. The condition of the population in respect to cardiac soundness played a significant rôle in determining the suddenness and frequency with which people died during the autumn and winter of 1918, when the 34 large American cities were struck by the influenza epidemic. It is interesting to note that the net sixth order correlation coefficient is higher in the case of organic diseases of the heart than the gross zero order coefficient, which is $r_{23b} = +0.487 \pm 0.088$. This means that in the gross, or zero order coefficient, the true organic relationship existing between destructiveness of epidemic and normal cardiac death rate is obscured by the fact that there is a high correlation between the latter variable and the age distribution of the population ($r_{3b_4} = +0.609 \pm 0.073$), the meaning of this coefficient being, of course, that the higher the average age of a population, the higher the death rate from organic diseases of the heart, and *vice versa*—a relationship which would be expected *a priori* from what we know about cardiac affections. As soon as we make the cities all constant in respect to age distribution of the population, we get a marked increase in the correlation coefficient between epidemic destructiveness and normal cardiac rate ($r_{23b.4} = +0.596 \pm 0.075$). This is an increase of 0.109 in the coefficient. But, as there is also a sensible negative correlation in this group of 34 cities between normal death rate from organic heart diseases and latitude ($r_{3b.7} = -0.300 \pm 0.105$), the high value of $r_{23b.4} = +0.596 \pm 0.075$ is reduced somewhat when the cities are made constant in respect to both age distribution and latitude, the coefficient being $r_{23b.47} = +0.549 \pm 0.081$. The other demographic and environmental variables have only negligible effect upon the r_{23b} correlation.

4. The net correlation between destructiveness of the epidemic and the normal death rate from diseases of the kidneys is sensibly zero. Here again there is a marked contrast between explosiveness of epidemic mortality and destructiveness (cf. Table III, Influenza Studies II). The gross zero order correlation between destructiveness and normal death rate from kidney diseases ($r_{23c} = +0.282 \pm$

0.106) is less than three times its probable error, as well as the net sixth order coefficient.

5. The destructiveness of the epidemic is not significantly correlated with the normal death rate from either typhoid fever or cancer, either net, when all the demographic and environmental variables are held constant, or in gross ($r_{23d} = +0.014 \pm 0.116$, and $r_{23e} = +0.215 \pm 0.110$). We observe the same contrast in the correlations of these diseases with destructiveness as we did in the previous study, when they were correlated with explosiveness, in comparison with the correlation of normal death rate from organic diseases of the heart with these same epidemiological characteristics.

V. Summary.

In order to meet a justifiable criticism of the earlier work we have determined in this paper the correlations between destructiveness of the influenza epidemic of 1918–19, as measured by the 25-week excess mortality in the 34 cities used in the earlier work, and the series of demographic, environmental, and biological (normal death rate) variables discussed in Studies II. It is found that there is, in the group of large cities, no significant net correlation between destructiveness of the epidemic as above defined, and any demographic or environmental variable, with the exception of latitude. In that case, for reasons fully discussed in Studies II, the biological meaning to be attached to the result is not entirely clear. The highest net correlation between destructiveness and any of the 12 variables discussed was with the normal death rate from organic diseases of the heart. Those cities, within this group of 34, which have normally an unusually high death rate from cardiac disorder, had an unusually high epidemic mortality, and *vice versa*. There was no significant net correlation between destructiveness of the epidemic and the normal death rate from acute nephritis and Bright's disease, nor with that from pulmonary tuberculosis. The correlation results indicate clearly that explosiveness of outbreak of epidemic mortality and total destructiveness of the epidemic are distinct but related epidemological characteristics.

IV. ON THE CORRELATION BETWEEN EXPLOSIVENESS AND TOTAL DESTRUCTIVENESS OF THE EPIDEMIC MORTALITY.[15]

The results of the second and third of these Studies indicate clearly that explosiveness of outbreak of epidemic mortality (as measured by the epidemicity index I_6) and total destructiveness of the epidemic (as measured by the 25-week excess mortality) are distinct epidemiological characters. The question then presents

[15] Papers from the Department of Biometry and Vital Statistics, School of Hygiene and Public Health, Johns Hopkins University. No. 23.

itself as to how closely these two characters are correlated. To the answer of this question the present paper is addressed.

For the 34 large American cities furnishing the material set forth in Table I of the second of these Studies,[16] we have data on the following variables:

Subscript No.	Variable.
1.	Explosiveness of outbreak of epidemic mortality, I_6.
2.	Destructiveness (25-week excess mortality).
3a.	Normal death rate from pulmonary tuberculosis.
3b.	Normal death rate from organic heart diseases.
3c.	Normal death rate from acute nephritis and Bright's disease.
3d.	Normal death rate from typhoid fever.
3e.	Normal death rate from cancer and other malignant tumors.
3f.	Normal death rate from all causes.
4.	Age distribution of population.
5.	Sex ratio of population.
6.	Density of population.
7.	Latitude.
8.	Longitude.
9.	Rate of growth of population, 1900-1910.

The gross or zero order correlation between explosiveness of epidemic mortality (I_6) and total destructiveness (25-week excess mortality) is

$$r_{12} = +0.709 \pm 0.058.$$

This obviously represents a relatively high, but by no means perfect, correlation. In general, it means that cities having an incidence of epidemic mortality more sudden and explosive in its outbreak than the average were highly likely to have a total mortality from the epidemic above the average, and *vice versa*.

It is essential, however, just as in earlier parts of these Studies, to find the *net* value of this correlation when the various environmental, demographic, and biological variables listed at the beginning of this paper are held constant as in an experiment The initial step in such a process is to calculate the first-order coefficients, where successively, one at a time, each variable in the series is held constant while the correlation between variables 1 and 2, in which we are interested, is determined.[1] In Table I are given these first-order correlation coefficients between the variables 1 and 2 (explosiveness and destructiveness).

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[16] See p. 279.

[1] For a general discussion of the method of multiple correlation in statistical work of this sort the reader is referred to these Studies, II, pp. 272-275.

TABLE 1.—*First-order correlations between explosiveness (I_6) and destructiveness (25-week excess mortality) of the 1918 influenza epidemic in 34 American cities.*

r subscripts.	Coefficient.
12.3a	+0.626±0.070
12.3b	+0.592±0.075
12.3c	+0.679±0.062
12.3d	+0.750±0.051
12.3e	+0.694±0.060
12.3f	+0.626±0.070
12.4	+0.718±0.056
12.5	+0.736±0.053
12.6	+0.707±0.058
12.7	+0.687±0.061
12.8	+0.729±0.054
12.9	+0.723±0.055

It is evident from this table that making any single one of the 12 variables constant has little effect upon the correlation between explosiveness and destructiveness of the epidemic mortality. The coefficients are all relatively high.

Let us examine the effect of making *all* the demographic and environmental factors (subscripts 4 to 9, inclusive) constant at the same time. The coefficient is

$$r_{12.456789} = +0.706 \pm 0.058.$$

This is almost absolutely identical with the zero order gross coefficient given above. This result means that the factors age and sex distribution, density and rate of recent growth of the population, latitude and longitude of the city (with all implied climatic differences), have no influence in determining the correlation between explosiveness and total excess mortality rate.

Taking in the biological (normal death rate) variables we have the following seventh-order coefficients:

$$r_{12.3a456789} = +0.675 \pm 0.063$$
$$r_{12.3b456789} = +0.579 \pm 0.077$$
$$r_{12.3c456789} = +0.711 \pm 0.057$$
$$r_{12.3d456789} = +0.749 \pm 0.051$$
$$r_{12.3e456789} = +0.700 \pm 0.059$$
$$r_{12.3f456789} = +0.632 \pm 0.069$$

It is obvious that these normal death rates influence very little, either one way or the other, the correlation between explosiveness and destructiveness of the epidemic outbreak.

One point of considerable interest which attaches to the relatively high correlation between these two variables is that one of the variables is measurable in time long before the value of the other can be possibly determined. The value of the explosiveness index I_6 can usually be determined in from 2 to 4 weeks after the beginning of the epidemic, while the total excess mortality can only be measured when the epidemic is all over. With a correlation coefficient of the

magnitude of r_{12} above, one can, by means of the regression equation, make a very fair prediction of the total excess mortality rate from a knowledge of the explosiveness of outbreak of the mortality measured

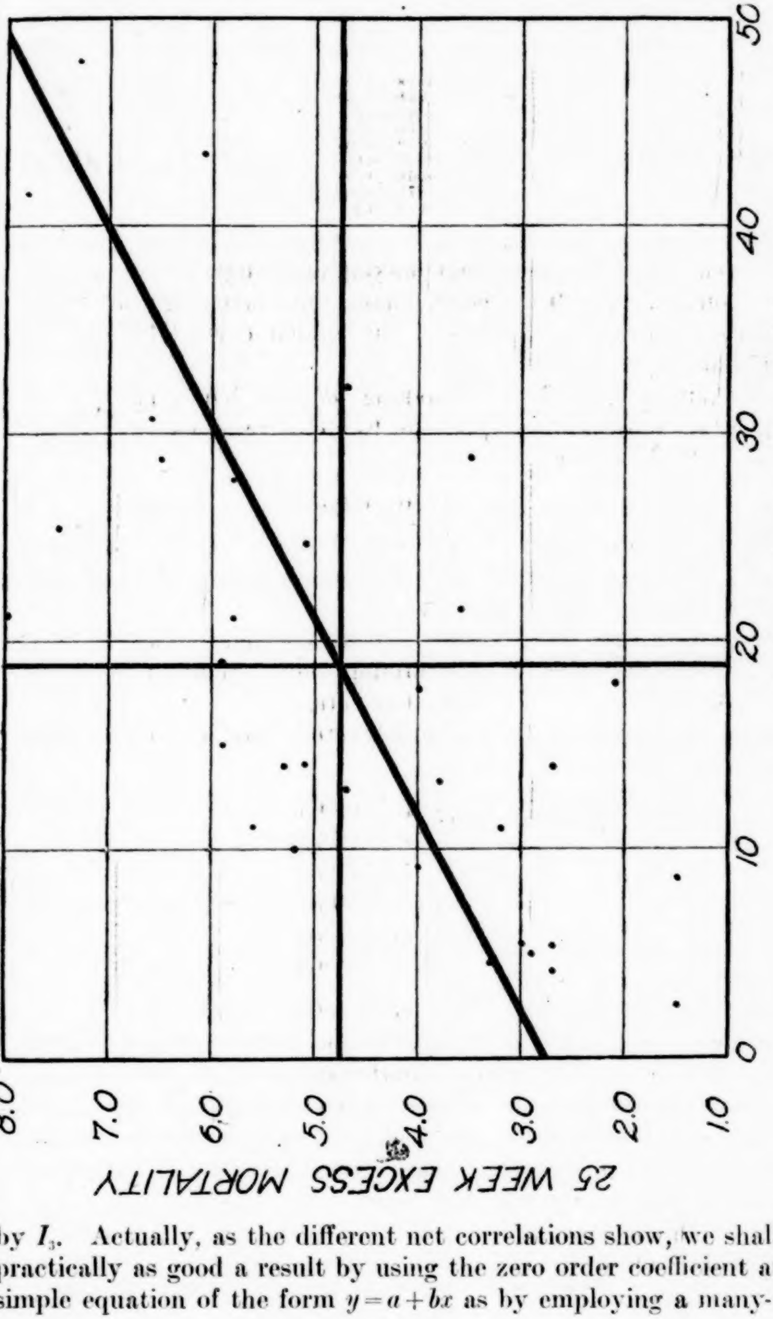

FIG. 2.—Regression line of 25-week excess mortality rate of influenza epidemic on explosiveness of outbreak of epidemic mortality.

by I_3. Actually, as the different net correlations show, we shall get practically as good a result by using the zero order coefficient and a simple equation of the form $y=a+bx$ as by employing a many-con-

stant partial regression equation. Actually the regression equation from the zero order r_{12} is

$$D = 2.7412 + 0.1065\ I_6$$

where D denotes 25-week excess mortality rate and I_6 is the epidemicity or explosiveness index. This regression line is shown graphically in Figure 2.

SUGGESTED HEALTH PROVISIONS FOR STATE LAWS RELATING TO CHILDREN.

Report of the Advisory Committee to the National Child Health Council on Health Provisions for Laws Relating to Children.

In view of the fact that a number of States have children's code commissions at work, which are dealing with various aspects of child welfare, it is especially desirable to call attention at this time to the need for child-health provisions in order that they may receive the consideration that they merit. Therefore, there is presented here a report of the advisory committee to the National Child Health Council on Health Provisions for Laws Relating to Children.

The advisory committee is composed of the following members:

Courtenay Dinwiddie, chairman, executive secretary, National Child Health Council, Washington, D. C.

James A. Tobey, secretary, assistant director, department of health service, American Red Cross, Washington, D. C.

Richard A. Bolt, M. D., general director, American Child Hygiene Association, Baltimore, Md.

E. Dana Caulkins, manager, National Physical Education Service, Washington, D. C.

Taliaferro Clark, medical officer in charge of field investigations in child hygiene, United States Public Health Service, Washington, D. C.

Edward N. Clopper, assistant secretary, National Child Labor Committee, New York, N. Y.

Anna E. Rude, M. D., director, division of hygiene, Children's Bureau, United States Department of Labor, Washington, D. C.

Willard S. Small, Ph. D., specialist in school hygiene, Bureau of Education, Department of the Interior, Washington, D. C.

FOREWORD.

Inasmuch as health is of paramount importance to child life and as it has often received minor consideration in State children's codes, the Committee on Health Provisions for Laws Relating to Children wishes to emphasize the need for adequate treatment of this subject by all States. The following are points which should be borne in mind.

1. PRENATAL CARE.

(A) State children's code commissions should recommend the removal of all legislative restrictions which prevent proper and complete measures for prenatal and maternity care and the granting of positive legislative authority for undertaking and promoting such measures. (NOTE.—Examples of legislative restrictions that should be removed are such limitations as to tax rates or levies as make it impossible to provide adequate appropriations for the care of the health of mothers and children. Also in some States local authorities are not permitted to undertake certain important measures unless these are specifically authorized by statute. Such general legislative restrictions as prevent necessary health measures are apt to be overlooked in drafting health and welfare legislation.) Facilities for the education of expectant mothers, for the establishment of prenatal health centers and clinics, for the protection of expectant mothers in industry, and for the health supervision of mothers should be definitely authorized by law.

2. CARE AT BIRTH.

(A) *Midwives.*—State laws should require that all midwives be licensed by the State health department, for the purpose of permitting only those who are properly qualified, to practice midwifery, and that adequate provision be made for proper supervision by State or local health authorities of all such midwives, to see that they observe all regulations, subject to revocation of their licenses. Educational training for obstetrical attendants and midwives should be authorized only where the facilities for training are adequate and there is proper educational and health supervision.

(B) *Control of ophthalmia neonatorum ("babies' sore eyes").*—Every State health department should be specifically authorized by law to require the immediate reporting of all inflammatory conditions of the eyes of the new born, to require treatment of the eyes of the new born at birth, and to furnish the prophylactic for this purpose, for the prevention of blindness. (NOTE.—Experience has shown that the law should describe this disease rather than simply refer to it by its technical name.)

(C) *Vital statistics.*—The law should require the prompt reporting of births by the professional attendant to local registrars of vital statistics not later than three days after birth. Registrars should be under the health department. Legislation requiring the reporting of stillbirths is important.

(D) *Supervision of maternity homes.*—All institutions in which mothers are given care during or near confinement should be licensed, subject to the periodic inspection and approval of health authorities.

3. INFANT AND PRESCHOOL CARE.

(A) *Removal of legislative restrictions.*—Legislative restrictions should be removed and definite legislative authority granted so that adequate facilities for protecting and promoting the health of infants from birth to the beginning of school age can be provided by State and local authorities. (NOTE.—The type of legislation necessary for this purpose, with reference to babies, preschool children, and mothers, is indicated under paragraph 1–A, which deals with the prenatal period.)

(B) *Control of milk and milk products.*—There should be legislation requiring the general pasteurization of uncertified milk, the supervision of such pasteurization, and such other regulation and supervision of the production, handling, and preservation of milk and milk products as will insure a safe supply.

4. CARE OF CHILDREN IN SCHOOL.

(A) *Health education.*—There should be legislation providing for the instruction and training of all children of school age, for the purpose of developing health habits through supervised physical activities, free play, and practical instruction in hygiene, including personal hygiene, nutrition, and sanitation.

Adequate provision should be made for the promotion of health education by the States in cooperation with local communities.

Provision should be made for the instruction and training of all teachers in the fundamental principles of health education.

(NOTE.—Such legislation should allow scope for the development of initiative, spontaneity, and responsibility on the part of the child. Rigid and uniform courses of physical drill or of hygienic instruction should not be prescribed, but rather there should be the normal stimulation of the child's physical development and the interweaving of health education into all the many subjects of which it naturally forms a part.)

(B) *Physical examinations and health supervision.*—There should be State legislation making it possible for counties, municipalities, and townships to provide facilities for periodic physical examinations and for promoting the health of school children. The appropriate State authorities should be authorized to promote the development of such facilities. (NOTE.—The type of legislation necessary for this purpose is indicated under paragraph 1–A.)

It should be required that the health supervision of school children be closely correlated with the health supervision of babies and preschool children.

(C) *Health classes for special groups.*—Legislation should authorize facilities for the training and instruction of special groups which, by reason of disabilities, are unable to receive adequate education and health supervision in the regular classes.

(D) *Sanitation of schoolhouses and their environment.*—School buildings, school grounds, and accessories should be regularly inspected and supervised as to sanitary conditions, subject to the regulations and jurisdiction of the health authorities.

5. CHILDREN IN INDUSTRY.

(A) *Physical supervision and health education.*—As long as a child is of school age he should receive health education and supervision. (NOTE.—Experience shows that the continuation school offers an effective medium of health education and supervision.) Physical examinations should be given when he leaves school to go to work, at each change of occupation, and periodically thereafter while he is of school age.

6. GENERAL.

(A) *Administration.*—In each State there should be a bureau of child hygiene. The administration of all legislative provisions affecting the health of children, except those which properly pertain to other State agencies, should be vested in this bureau. The work of such other agencies and that of the bureau of child hygiene should be properly coordinated.

(B) *Control of institutions and agencies.*—All public and private institutions, agencies, courts, and boarding homes caring for dependent, defective, or delinquent children should be required by law to have adequate health supervision over their work and wards, subject to the regulations of the health authorities.

All measures dealing with the appropriation and expenditure of funds for material relief in connection with child or maternity care should specifically make provision for adequate care of the health.

REFERENCES FOR THOSE WHO ARE STUDYING CHILD HEALTH AND WELFARE LEGISLATION.

It is recommended that the following references be consulted:

Commission on Milk Standards—Third Report of the Commission on Milk Standards Appointed by the New York Milk Committee. Reprint No. 386 from the Public Health Reports, United States Public Health Service, Washington, D. C.

Commission on Milk Standards—Summary of the Reports of the National Commission on Milk Standards of the New York Milk Committee. Reprint No. 634 from the Public Health Reports, United States Public Health Service, Washington, D. C.

Model State Law for the Registration of Births and Deaths. Supplement No. 12 to the Public Health Reports, pp. 83–92, United States Public Health Service, Washington, D. C.

Model State Law for Morbidity Reports. Reprint No. 285 from the Public Health Reports, United States Public Health Service, Washington, D. C.

Report of Committee on Model Health Legislation. American Public Health Association, 169 Massachusetts Avenue, Boston, Mass.

State Commission for the Study and Revision of Child Welfare Laws. Publication No. 71, Children's Bureau, United States Department of Labor, Washington, D. C.

Recent State Legislation for Physical Education. Bureau of Education, United States Department of the Interior, Washington, D. C.

Report of the Committee on Vital and Penal Statistics (August, 1920), and

Model Birth Registration Laws (fourth draft), both from the National Conference of Commissioners on Uniform State Laws, Eugene A. Gilmore, chairman, University of Wisconsin, Madison, Wis.

THE CLEVELAND HOSPITAL AND HEALTH SURVEY.

No modern successful business organization would consider it a good policy to run from year to year without taking an inventory and making its annual report. These procedures are essential in order to know the conditions under which the business is operating, to know where there are preventable losses, and to have at hand the facts necessary upon which to formulate plans for improving the business.

If an inventory is essential to a business organization, in which only financial considerations are involved, it is surely none the less needed in the business of public health, the principal purpose of which is better public health and fewer preventable deaths, where, in addition to matters of dollars and cents, sickness and death are concerned.

In October, 1919, the Cleveland Hospital Council appointed a committee to make a hospital and health survey of Cleveland, and an exhaustive report of this committee, the result of the work of a large staff of experts in the various fields, has just been published. It consists of 11 parts, which give an idea of the scope of the survey: Part I, General Environment and Sanitation; Part II, Public Health Services and Private Health Agencies; Part III, A Program for Child Health; Part IV, Tuberculosis; Part V, Venereal Disease; Part VI, Mental Diseases and Mental Deficiency; Part VII, Industrial Medical Service, Women in Industry, Children in Industry; Part VIII, Education and Practice in Medicine, Dentistry, Pharmacy; Part IX, Nursing; Part X, Hospitals and Dispensaries; Part XI, Methods of Survey, Bibliography of Surveys, Index.

In the summary of the reports of the survey it was estimated that "sickness and deaths from communicable diseases cost Cleveland during 1919, $25,000,000, and that 2 per cent of the citizens are sick all the time from causes half of which are preventable. This does not mean that Cleveland is worse than other cities in the matter of public health, but it would indicate that it is no better." As Dr. Haven Emerson, who directed the survey, has well said, "it is impossible to state in terms of money equivalent the importance of public health, or the waste of money and human labor, the burden

upon life, and the deficit in human happiness which result from ill health."

It was emphasized by the council that there should be definite and specific recommendations, and the survey committee has carried out these instructions. The investigators, in leading up to their recommendations, laid bare all the needs and shortcomings which they found.

The amount originally set aside for the survey was $53,000, and, according to the latest estimates, it cost $52,668—only two-tenths of 1 per cent of the estimated amount that sickness and deaths cost the city during one calendar year.

The complete reports, separately bound by sections, may be obtained from the Cleveland Hospital Council, 308 Anisfield Building, Cleveland, Ohio; the single parts for 50 cents each, the complete set for $5.50, plus the postage.

DEATHS DURING WEEK ENDED FEB. 5, 1921.

Summary of information received by telegraph from industrial insurance companies for week ended Feb. 5, 1921. (From the "Weekly Health Index," Feb. 8, 1921, issued by the Bureau of the Census, Department of Commerce.)

Policies in force	45,778,701
Number of death claims	8,621
Death claims per 1,000 policies in force, annual rate	9.8

Deaths from all causes in certain large cities of the United States during the week ended Feb. 5, 1921, infant mortality, annual death rate, and comparison with corresponding week of preceding years. (From the "Weekly Health Index," Feb. 8, 1921, issued by the Bureau of the Census, Department of Commerce.)

City.	Estimated population, July 1, 1921.	Week ended Feb. 5, 1921.		Average annual death rate per 1,000.[2]	Deaths under 1 year.		Infant mortality rate.[3]	
		Total deaths.	Death rate.[1]		Week ended Feb. 5, 1921.	Previous year or years.[2]	Week ended Feb. 5, 1921.[4]	Corresponding week 1919.
Akron, Ohio	229,195	32	7.3	[5] 10.1	5	[5] 5	48	106
Albany, N. Y	115,071	28	12.7	C 19.2	3	C 3	67	81
Atlanta, Ga	207,473	69	17.3	C 21.3	9	C 8	....	....
Baltimore, Md	751,537	217	15.1	A 19.7	35	A 30	95	98
Birmingham, Ala	186,133	70	19.6	A 18.8	10	A 7	....	....
Boston, Mass	757,634	231	15.9	A 20.5	36	A 38	97	97
Bridgeport, Conn	149,967	41	14.3	A 18.5	11	A 7	139	88
Buffalo, N. Y	519,608	161	16.2	C 13.4	38	C 24	147	110
Cambridge, Mass	110,444	44	20.8	A 16.5	4	A 8	72	70
Camden, N. J	119,672	31	13.5	....	5	....	....	....
Chicago, Ill	2,780,655	702	13.2	A 16.2	131	A 126	....	....
Cincinnati, Ohio	403,418	115	14.9	C 21.2	19	C 14	126	88
Cleveland, Ohio	831,138	174	10.9	C 11.7	29	C 39	78	95
Dallas, Tex	165,282	37	11.7	A 15.7	3	A 4	....	....
Dayton, Ohio	158,119	33	10.9	C 12.3	2	C 2	33	89
Denver, Colo	263,152	69	13.7	A 15.9	8	....	....	....
Detroit, Mich	1,070,450	215	10.5	....	37	....	70	97
Fall River, Mass	120,668	48	20.7	C 21.2	11	C 15	165	119
Grand Rapids, Mich	141,197	28	10.3	C 15.6	3	C 7	51	85
Houston, Tex	144,349	30	10.8	....	3	....	....	....
Indianapolis, Ind	325,215	92	14.8	C 15.5	14	C 11	109	80
Jersey City, N. J	302,788	90	15.5	C 16.2	15	C 17	....	....
Kansas City, Kans	103,908	31	15.6	....	2	....	48	108
Kansas City, Mo	336,157	87	13.5	C 18.0	15	C 14	....	....
Los Angeles, Calif	611,636	185	15.8	A 14.9	10	A 14	47	67
Louisville, Ky	236,083	58	12.8	C 22.1	9	C 10	104	96
Lowell, Mass	113,757	34	15.6	A 16.7	6	A 7	97	121
Memphis, Tenn	165,389	35	11.0	C 28.6	4	C 11	....	....
Milwaukee, Wis	468,386	97	10.8	A 14.5	22	A 26	107	101
Minneapolis, Minn	392,815	87	11.5	C 10.5	22	C 12	125	65
Nashville, Tenn	119,536	49	21.4	C 23.2	5	C 3	....	....
New Bedford, Mass	125,012	25	10.4	A 17.6	5	A 8	77	122
New Haven, Conn	167,007	42	13.1	C 16.5	3	C 13	36	73
New Orleans, La	394,657	146	19.3	A 21.1	23	A 14	....	....
New York, N. Y	5,751,867	1,434	13.0	C 16.5	213	C 251	84	81
Newark, N. J	424,885	102	12.5	C 19.4	12	C 25	....	....
Norfolk, Va	121,260	22	9.5	....	7	....	124	108
Oakland, Calif	226,472	51	11.7	A 13.5	4	A 6	51	61
Omaha, Nebr	197,066	50	13.2	C 10.6	7	C 5	....	....
Paterson, N. J	137,463	35	13.3	....	6	....	....	....
Philadelphia, Pa	1,866,212	612	17.1	[5] 16.8	74	[5] 80	89	91
Pittsburgh, Pa	596,413	201	17.6	C 20.1	23	C 23	82	114
Portland, Oreg	264,850	73	14.4	C 8.5	6	C 5	60	69
Providence, R. I	239,645	79	17.2	C 20.4	9	C 10	....	....
Richmond, Va	145,686	52	15.4	C 20.2	9	C 12	110	106
Rochester, N. Y	305,229	76	13.0	C 13.4	9	C 11	70	74
St. Louis, Mo	786,164	200	13.3	C 15.7	25	C 22	....	....
St. Paul, Minn	237,781	40	8.8	C 11.9	7	C 7	70	68
Salt Lake City, Utah	121,595	29	12.4	A 14.3	7	....	108	77
San Francisco, Calif	520,546	138	13.8	C 16.4	9	C 4	52	62
Seattle, Wash	327,227	51	8.1	A 8.8	8	A 6	67	55
Spokane, Wash	104,442	18	9.0	C 10.5	0	C 5	0	55
Springfield, Mass	135,877	31	11.9	....	3	....	45	84
Syracuse, N. Y	177,265	43	12.6	C 12.8	8	C 5	96	91
Toledo, Ohio	253,606	69	14.2	A 15.3	10	A 10	101	90
Trenton, N. J	122,760	48	20.4	A 19.6	9	A 8	....	....
Washington, D. C	454,026	129	14.8	A 18.8	20	A 14	117	85
Wilmington, Del	113,408	34	15.6	C 16.4	4	....	....	....
Worcester, Mass	184,972	44	12.4	C 15.8	7	C 6	75	92
Yonkers, N. Y	103,324	14	7.1	A 13.8	5	A 4	113	80
Youngstown, Ohio	139,432	47	17.6	....	14	....	177	99

[1] Annual rates per 1,000 population.
[2] "A" indicates data for the corresponding week of the years 1913 to 1917, inclusive. "C" indicates data for the corresponding week of the year 1918.
[3] Cities left blank are not in the registration area for births.
[4] Deaths under 1 year per 1,000 births—an annual rate based on deaths under 1 year for the week and estimated births for 1920.
[5] Data are based on statistics of 1915, 1916, and 1917.

PREVALENCE OF DISEASE.

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring.

UNITED STATES.

CURRENT STATE SUMMARIES.

Telegraphic Reports for Week Ended Feb. 12, 1921.

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers.

ALABAMA.

	Cases.
Cerebrospinal meningitis	1
Chicken pox	25
Hookworm	62
Influenza	5
Measles	15
Pellagra	1
Pneumonia	5
Scarlet fever	5
Smallpox:	
Jefferson County	55
Mobile County	25
Scattering	16
Tetanus	1
Tuberculosis	11
Typhoid fever	5

ARKANSAS.

Cerebrospinal meningitis	1
Chicken pox	51
Diphtheria	18
Influenza	70
Malaria	77
Measles	207
Ophthalmia neonatorum	1
Pellagra	6
Poliomyelitis	1
Scarlet fever	21
Smallpox	11
Trachoma	3
Tuberculosis	7
Typhoid fever	2
Whooping cough	63

CALIFORNIA.

Cerebrospinal meningitis	2
Influenza	98
Lethargic encephalitis:	
San Francisco	3
Place not stated	1

CALIFORNIA—continued.

	Cases.
Poliomyelitis—Los Angeles	1
Smallpox:	
Berkeley	8
Sacramento	14
San Francisco	66
Turlock	9
Scattering	84

CONNECTICUT.

Cerebrospinal meningitis	2
Chicken pox	87
Conjunctivitis (infectious)	15
Diphtheria:	
Bridgeport	12
Hartford	13
New Haven	16
Scattering	61
German measles	4
Influenza	9
Lethargic encephalitis	6
Measles:	
Greenwich	14
Middletown (city)	22
New Britain	34
Scattering	63
Mumps	74
Pneumonia (lobar)	24
Scarlet fever:	
Bridgeport	21
Meriden (city)	12
New Haven	49
Scattering	60
Septic sore throat	1
Trachoma	1
Tuberculosis (all forms)	61
Typhoid fever	4
Whooping cough	108

DELAWARE.

	Cases.
Chicken pox	3
Diphtheria	1
Influenza	7
Mumps	2
Pneumonia	9
Scabies	1
Scarlet fever	15
Tuberculosis	3
Whooping cough	12

FLORIDA.

Cerebrospinal meningitis	1
Diphtheria	16
Influenza	6
Malaria	9
Pneumonia	2
Scarlet fever	3
Smallpox	53
Typhoid fever	10

GEORGIA.

Chicken pox	78
Conjunctivitis (acute infectious)	2
Diphtheria	8
Dysentery (bacillary)	1
Hookworm	20
Influenza	26
Malaria	31
Measles	116
Mumps	9
Pneumonia	20
Scarlet fever	9
Septic sore throat	6
Smallpox	383
Tuberculosis (all forms)	39
Typhoid fever	6
Whooping cough	16

ILLINOIS.

Cerebrospinal meningitis:	
Crawford County—Montgomery Township	3
Evanston	1
Olney	1
Diphtheria:	
Chicago	188
Scattering	73
Influenza	35
Lethargic encephalitis:	
Antioch	1
Chicago	15
Cicero	1
Forest Park	1
Hamilton County—Crouch Township	2
Iroquois County—Concord Township	1
McLeansboro	2
New Salem	1
Oak Park	3
Standard	1
Pneumonia	330
Poliomyelitis:	
Chatham	1
Kansas	1

ILLINOIS—continued.

	Cases.
Scarlet fever:	
Chicago	134
Rockford	18
Springfield	72
Scattering	154
Smallpox:	
Chester	19
Chicago	19
East St. Louis	28
Rockford	36
West Salem	9
Will County—Joliet Township	13
Scattering	110
Typhoid fever	12

INDIANA.

Diphtheria	56
Rabies in animals:	
Bartholomew County	1
Parke County	1
Scarlet fever	288
Smallpox	185
Typhoid fever	5

IOWA.

Cerebrospinal meningitis—Davenport	1
Diphtheria	51
Scarlet fever	147
Smallpox:	
Davenport	9
Dubuque	25
Hiteman	10
Ottumwa	19
Shenandoah	15
Scattering	146

KANSAS.

Cerebrospinal meningitis	1
Chicken pox	98
Diphtheria	127
German measles	1
Influenza	9
Lethargic encephalitis	2
Malaria	1
Measles	412
Mumps	13
Pneumonia	56
Scarlet fever	163
Smallpox	213
Tuberculosis	44
Typhoid fever	5
Whooping cough	78

LOUISIANA.

Cerebrospinal meningitis	1
Diphtheria	23
Scarlet fever	7
Smallpox	68
Typhoid fever	13

MAINE.

Disease	Cases.
Cerebrospinal meningitis	1
Chicken pox	18
Diphtheria	13
Influenza	2
Measles	297
Mumps	6
Pneumonia	15
Scarlet fever	23
Smallpox	7
Tuberculosis	6
Typhoid fever	4
Whooping cough	125

MARYLAND.[1]

Disease	Cases.
Chicken pox	137
Diphtheria	51
German measles	3
Influenza	164
Lethargic encephalitis	6
Malaria	3
Measles	96
Mumps	28
Pneumonia (all forms)	207
Scarlet fever	60
Septic sore throat	6
Smallpox	7
Trachoma	1
Tuberculosis	61
Typhoid fever	7
Whooping cough	125

MASSACHUSETTS.

Disease	Cases.
Anthrax	1
Cerebrospinal meningitis	7
Chicken pox	399
Conjunctivitis (suppurative)	1
Diphtheria	207
German measles	21
Influenza	37
Measles	490
Mumps	134
Ophthalmia neonatorum	26
Pneumonia (lobar)	98
Poliomyelitis	3
Scarlet fever	348
Septic sore throat	6
Trachoma	3
Tuberculosis (all forms)	144
Typhoid fever	8
Whooping cough	187

MINNESOTA.

Disease	Cases.
Chicken pox	39
Diphtheria	67
Measles	37
Pneumonia	6
Scarlet fever	164
Smallpox:	
Minneapolis	144
Scattering	303
Tuberculosis	68
Typhoid fever	11
Whooping cough	14

[1] Week ended Friday.

MISSISSIPPI.

Disease	Cases.
Diphtheria	14
Scarlet fever	10
Smallpox	37
Typhoid fever	10

MISSOURI.

Disease	Cases.
Cerebrospinal meningitis	1
Chicken pox	134
Diphtheria	178
Epidemic sore throat	27
Influenza	32
Measles	117
Mumps	39
Ophthalmia neonatorum	1
Scarlet fever	160
Smallpox	222
Trachoma	5
Tuberculosis	56
Typhoid fever	6
Whooping cough	102

MONTANA.

Disease	Cases.
Diphtheria	11
Scarlet fever	14
Smallpox	30

NEBRASKA.

Disease	Cases.
Cerebrospinal meningitis—Kramer	1
Chicken pox	33
Diphtheria	12
Influenza	2
Measles:	
Greenwood	16
Scattering	14
Mumps	5
Scarlet fever:	
Beukelman	8
Grand Island	13
Omaha	12
St. Paul	22
Lincoln	8
York	12
Scattering	36
Smallpox:	
Beatrice	9
Clay County	8
Cotesfield	14
Lancaster County	13
Lexington	11
Omaha	17
St. Paul	25
Seward County	12
Scattering	108
Typhoid fever	2

NEW JERSEY.

Disease	Cases.
Cerebrospinal meningitis	5
Chicken pox	367
Diphtheria	189
Influenza	20
Measles	151
Pneumonia	177
Scarlet fever	295
Trachoma	1
Typhoid fever	4
Whooping cough	270

NEW MEXICO.

	Cases.
Cerebrospinal meningitis	1
Chicken pox	27
Conjunctivitis	1
Diphtheria:	
Santa Fe	14
Scattering	42
Favus	3
German measles	1
Influenza	6
Lethargic encephalitis	1
Measles	183
Mumps	22
Pneumonia	23
Scarlet fever	11
Smallpox	5
Tuberculosis	132
Typhoid fever	1
Whooping cough	50

NEW YORK.

(Exclusive of New York City.)

Cerebrospinal meningitis	4
Diphtheria	273
Influenza	44
Lethargic encephalitis	16
Measles	1,332
Pneumonia	382
Poliomyelitis—Brockport	1
Scarlet fever	381
Smallpox	3
Typhoid fever	26
Whooping cough	510

NORTH CAROLINA.

Chicken pox	167
Diphtheria	23
German measles	7
Measles	592
Ophthalmia neonatorum	1
Poliomyelitis	1
Scarlet fever	14
Smallpox	136
Typhoid fever	4
Whooping cough	261

SOUTH DAKOTA.

Actinomycosis	1
Cerebrospinal meningitis	1
Chicken pox	11
Diphtheria	20
Measles	5
Pneumonia	15
Scarlet fever	28
Smallpox	106
Tuberculosis	4
Whooping cough	2

TEXAS.

Chicken pox	181
Diphtheria	62
Influenza	113
Measles	136
Paratyphoid fever	1
Scarlet fever	40
Smallpox	129
Trachoma	18
Typhoid fever	9
Typhus fever	1

VERMONT.

	Cases.
Chicken pox	60
Diphtheria	5
Influenza	1
Measles	136
Mumps	19
Poliomyelitis	1
Scarlet fever	48
Smallpox	10
Typhoid fever	2
Whooping cough	49

VIRGINIA.

Smallpox:	
Grayson County	1
Tazewell County	3

WASHINGTON.

Chicken pox	151
Diphtheria	37
Measles	63
Mumps	15
Pneumonia	3
Scarlet fever	60
Smallpox	142
Tuberculosis	15
Typhoid fever	4
Whooping cough	25

WEST VIRGINIA.

Diphtheria	14
Measles:	
Bluefield	13
Charleston	69
Hinton	40
Montgomery	10
Wheeling	22
Scattering	5
Scarlet fever	20
Smallpox	22
Typhoid fever	2

WISCONSIN.

Milwaukee:	
Chicken pox	40
Diphtheria	39
German measles	5
Measles	14
Scarlet fever	41
Smallpox	37
Tuberculosis	21
Typhoid fever	1
Whooping cough	8
Scattering:	
Cerebrospinal meningitis	3
Chicken pox	116
Diphtheria	92
German measles	2
Influenza	48
Measles	146
Poliomyelitis	1
Scarlet fever	191
Smallpox	229
Tuberculosis	11
Typhoid fever	1
Whooping cough	85

District of Columbia and Kentucky Reports for Week Ended Feb. 5, 1921.

DISTRICT OF COLUMBIA.

	Cases.
Cerebrospinal meningitis	1
Chicken pox	41
Diphtheria	31
Influenza	4
Lethargic encephalitis	1
Measles	99
Scarlet fever	41
Smallpox	1
Tuberculosis	32
Typhoid fever	4
Whooping cough	35

KENTUCKY.

	Cases.
Cerebrospinal meningitis:	
Harlan County	1
Jefferson County	2
Chicken pox	39
Diphtheria:	
Jefferson County	16
Scattering	21
Dysentery	1
Influenza	33
Measles:	
Bell County	10
Boyd County	65
Grant County	29
Harlan County	20
Scattering	26

KENTUCKY—continued.

	Cases.
Mumps	16
Paratyphoid	1
Pneumonia	42
Scarlet fever:	
Hopkins County	16
Jefferson County	25
Kenton County	9
Scattering	20
Septic sore throat	1
Smallpox:	
Daviess County	10
Hopkins County	15
Muhlenberg County	9
Whitley County	11
Scattering	38
Trachoma	4
Tuberculosis:	
Jefferson County	32
Scattering	6
Typhoid fever	39
Whooping cough	35

SUMMARY OF CASES REPORTED MONTHLY BY STATES.

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week.

State.	Cerebrospinal meningitis.	Diphtheria.	Influenza.	Malaria.	Measles.	Pellagra.	Poliomyelitis.	Scarlet fever.	Smallpox.	Typhoid fever.
California (September, 1920)	11	416	61	69	180	2	11	227	200	184
California (December, 1920)	23	862	136	25	1,017	1	9	570	726	69
Connecticut (January, 1921)	6	430	55		544		2	621	1	8
Florida (January, 1921)	2	77	23	23	18			31	132	47
Maine (March, 1920)	1	35	1,789		125			78	13	14
Maine (April, 1920)	1	32	128		46			85	26	9
Maine (July, 1920)	1	47	3		363			67	15	27
Massachusetts (January, 1921)	21	965	158	1	2,230	1	10	1,137	9	38
Montana (December, 1920)	1	24			853		1	57	120	4
Nebraska (January, 1921)	1	85	19		74			274	521	18
Vermont (January, 1921)		19	14		182			119	15	21
Wyoming (December, 1920)		6			41			53	43	4

MISCELLANEOUS REPORTS.

Plague.[1]

HUMAN CASES OF PLAGUE REPORTED.

One death from plague occurred at Hollister, San Benito County, Calif., February 7, 1921. The case originated near an old plague-squirrel focus at the southern end of the county.

Place.	Period covered.	Cases.	Deaths.	Remarks.
Florida:	1921.			
Pensacola	Jan. 1 to Feb. 12	0	0	
Louisiana:				
New Orleans	do	0	0	
Texas:				
Beaumont	do	0	0	
Galveston	do	0	0	

[1] A summary of the reports received of the occurrence of plague and the finding of plague-infected rodents in the United States during 1920 was published in Public Health Reports, Jan. 7, 1921, p. 15.

PLAGUE-INFECTED RODENTS.

Place.	Period covered.	Rodents found plague infected.
Florida:	1921.	
Pensacola	Jan. 1 to Feb. 7	1
	Feb. 8 to 12	2
Louisiana:		
New Orleans	Jan. 1 to Feb. 5	21
	Feb. 6 to 16	9
Texas:		
Beaumont	Jan. 1 to Feb. 12	0
Galveston	do	0

Typhus Fever.

During the week ended January 15, 1921, one case of typhus fever was reported at Los Angeles, Calif.

CITY REPORTS FOR WEEK ENDED JAN. 29, 1921.

ANTHRAX.

Place.	Cases.	Deaths.
Delaware:		
Wilmington	1	

CITY REPORTS FOR WEEK ENDED JAN. 29, 1921—Continued.

CEREBROSPINAL MENINGITIS.

The column headed "Median for previous years" gives the median number of cases reported during the corresponding weeks of the years 1915 to 1920, inclusive. For cities for which the information is not available for the full six years, as many years as possible are included.

Place.	Median for previous years.	Week ended Jan. 29, 1921.		Place.	Median for previous years.	Week ended Jan. 29, 1921.	
		Cases.	Deaths.			Cases.	Deaths.
California:				Michigan:			
Los Angeles	0	1		Detroit	1	4	
San Francisco	0	2		Ironwood	0	1	1
District of Columbia:				Saginaw	0		2
Washington	0	1		New Jersey:			
Illinois:				Jersey City	0	1	
Chicago	3	3	2	New York:			
East St. Louis	0		1	New York	7	4	2
Indiana:				Rochester	0		1
Indianapolis	0	2		Ohio:			
Kentucky:				Akron	0	1	
Louisville	1	1		Cincinnati	0	1	1
Maine:				Cleveland	0	1	
Sanford	0	1		Pennsylvania:			
Massachusetts:				Erie	0	1	
New Bedford	0	1	1	Philadelphia	1	1	
Westfield	0	1	1	Pittsburgh	0	1	
				West Virginia:			
				Huntington	0		1

DIPHTHERIA.

See p. 318; also Telegraphic weekly reports from States, p. 305, and Monthly summaries by States, p. 309.

INFLUENZA.

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
Alabama:			Massachusetts—Continued.		
Montgomery	1		Brookline	1	
Arkansas:			Cambridge	1	
Little Rock	6		Clinton	1	
North Little Rock	1		Everett	1	1
California:			Haverhill	1	
Alameda	3		Leominster	1	
Long Beach	1		Lynn	1	
Los Angeles	1	2	New Bedford	1	
Colorado:			Worcester	1	1
Denver		2	Michigan:		
District of Columbia:			Detroit	2	2
Washington	4		Flint	5	
Georgia:			Minnesota:		
Rome	6		Minneapolis	1	2
Illinois:			Missouri:		
Chicago	18	8	Independence	1	
Danville	2		Kansas City	3	2
Indiana:			New Jersey:		
Hammond		1	Belleville	2	
Kansas:			Jersey City	1	
Topeka	2		Passaic	4	
Kentucky:			Plainfield	1	
Lexington	1		Trenton	15	1
Louisiana:			New York:		
Baton Rouge	3		Albany	3	
New Orleans	1	3	Buffalo	1	1
Maine:			Elmira	1	
Biddeford	1		Hudson	2	
Maryland:			Jamestown	1	
Baltimore	58	1	Mount Vernon	1	
Cumberland	2		New York	72	10
Massachusetts:			Watervliet	1	1
Boston	8	1			

CITY REPORTS FOR WEEK ENDED JAN. 29, 1921—Continued.

INFLUENZA—Continued.

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
Ohio:			Texas:		
Akron	1		Dallas	2	1
Cincinnati		4	Utah:		
Cleveland	3	2	Salt Lake City	1	
Columbus	2	1	Virginia:		
Toledo		2	Richmond	4	1
Pennsylvania:			Roanoke	1	
Philadelphia	4	6	West Virginia:		
Rhode Island:			Morgantown	6	
Pawtucket		1	Wisconsin:		
South Dakota:			Racine		1
Sioux Falls	2		Wausau	2	

LETHARGIC ENCEPHALITIS.

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
California:			Michigan:		
San Francisco	1		Marquette	1	
Illinois:			Missouri:		
Jacksonville	1		Kansas City	1	
Oak Park	1		Oregon:		
Kansas:			Portland	2	
Topeka	1		Tennessee:		
Massachusetts:			Memphis		1
Boston	5	2			

MALARIA.

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
California:			Missouri:		
Sacramento	1		Springfield		1
Louisiana:			Texas:		
Alexandria	8		Dallas	2	
			Waco		1

MEASLES.

See p. 318; also Telegraphic weekly reports from States, p. 305, and Monthly summaries by States, p. 309.

PELLAGRA.

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
Alabama:			Louisiana:		
Birmingham		1	Baton Rouge	1	
Mobile		3	Oklahoma:		
			Oklahoma City		1

PNEUMONIA (ALL FORMS).

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
Alabama:			California—Continued.		
Anniston	2		Los Angeles	34	11
Birmingham		4	Oakland		7
Mobile		1	Pasadena	4	
Montgomery		1	Sacramento		3
Tuscaloosa	1		San Bernardino		1
Arizona:			San Diego		3
Tucson		3	San Francisco	21	9
Arkansas:			Santa Barbara		1
Little Rock	[illegible]		Stockton		4
North Little Rock		2	Vallejo		1
California:			Colorado:		
Alameda	2	1	Denver		9
Eureka		1	Greeley		1
Long Beach		6			

CITY REPORTS FOR WEEK ENDED JAN. 29, 1921—Continued.

PNEUMONIA (ALL FORMS)—Continued.

Place.	Cases.	Deaths.
Connecticut:		
Bridgeport		6
Greenwich	1	
Hartford	8	
Meriden	1	
New Haven		7
New London		2
Norwalk	2	1
Norwich		1
District of Columbia:		
Washington		9
Georgia:		
Atlanta		5
Macon		2
Rome	1	
Illinois:		
Aurora	2	1
Bloomington		3
Chicago	353	94
Danville	2	
Decatur		1
East St. Louis		7
Elgin		1
Evanston	1	
Freeport		2
Galesburg		1
Jacksonville		2
La Salle	2	
Oak Park	5	2
Peoria		3
Rockford		3
Rock Island		2
Springfield		4
Indiana:		
Crawfordsville		2
East Chicago		2
Elkhart		2
Fort Wayne		6
Gary		6
Hammond		1
Indianapolis		13
Logansport		1
Marion		1
Mishawaka		2
South Bend		1
Terre Haute		4
Iowa:		
Council Bluffs		1
Kansas:		
Fort Scott		2
Kansas City	8	
Lawrence		1
Topeka		2
Wichita		2
Kentucky:		
Covington		3
Lexington		3
Louisville		5
Louisiana:		
Baton Rouge	3	1
Maine:		
Biddeford	1	
Maryland:		
Baltimore	73	17
Cumberland	3	
Massachusetts:		
Adams	1	
Arlington		1
Boston		32
Brockton		2
Brookline	1	
Cambridge		5
Chelsea		2
Clinton	4	4
Everett	1	
Fall River	6	4
Haverhill		6
Holyoke		2
Massachusetts—Continued.		
Lowell	5	3
Lynn	6	1
Malden		1
Methuen	1	
New Bedford		7
Newburyport		1
Pittsfield		3
Salem		2
Saugus	1	
Somerville	1	
Southbridge	3	
Springfield	1	
Taunton	2	
Wakefield		1
Waltham	2	1
Watertown	3	
Westfield		1
Winthrop		1
Worcester	12	8
Michigan:		
Ann Arbor	2	1
Detroit	50	30
Flint		3
Grand Rapids	12	1
Holland	2	
Ironwood	1	
Ishpeming	2	1
Kalamazoo	6	1
Marquette		2
Muskegon	3	1
Port Huron	4	3
Saginaw		4
Minnesota:		
Duluth		4
Minneapolis		6
St. Paul		9
Missouri:		
Independence		1
Kansas City	12	11
St. Joseph		2
Springfield		2
Montana:		
Billings		2
Butte		3
Great Falls	6	2
Nebraska:		
Lincoln	7	2
Omaha		14
Nevada:		
Reno	1	
New Hampshire:		
Keene		2
Manchester		3
Portsmouth	1	
New Jersey:		
Atlantic City	2	1
East Orange	3	
Elizabeth		4
Englewood		1
Gloucester City	1	
Hackensack	4	1
Harrison	2	
Hoboken		2
Irvington	1	
Jersey City	12	
Kearny	2	
Montclair	4	1
Newark	64	11
Orange	2	1
Passaic	4	1
Paterson	3	
Perth Amboy		1
Phillipsburg		1
Plainfield	2	
Trenton	5	
West Orange		1

CITY REPORTS FOR WEEK ENDED JAN. 29, 1921—Continued.

PNEUMONIA (ALL FORMS)—Continued.

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
New York:			Ohio—Continued.		
Albany	13		Springfield		2
Buffalo	52	19	Tiffin	1	
Cohoes	4		Toledo		8
Elmira	4	2	Zanesville		3
Glens Falls	2	1	Oklahoma:		
Hudson	1		Oklahoma City		3
Ithaca	3	2	Tulsa	1	
Jamestown	4		Oregon:		
Lackawanna	5	2	Portland		6
Lockport	2	1	Pennsylvania:		
Mount Vernon	3	2	Philadelphia	142	95
New York	390	193	Rhode Island:		
Niagara Falls		2	Cranston		1
North Tonawanda	1		Pawtucket		3
Peekskill	1		Providence		8
Port Chester		1	South Carolina:		
Poughkeepsie		2	Charleston		2
Rochester	17	8	Spartanburg		1
Rome	6		South Dakota:		
Saratoga Springs		3	Sioux Falls		2
Schenectady	1		Tennessee:		
Syracuse	13	5	Memphis		7
Troy	10	3	Texas:		
Watervliet	1		Corpus Christi	1	
White Plains	3	1	Dallas	11	2
Yonkers		2	Galveston		1
North Carolina:			Virginia:		
Charlotte		3	Alexandria	4	
Durham		1	Norfolk	2	
Wilmington		3	Richmond		5
Winston-Salem		3	Roanoke		3
Ohio:			West Virginia:		
Akron	5		Charleston		2
Canton		1	Huntington		2
Chillicothe		1	Parkersburg		1
Cincinnati		7	Wheeling		6
Cleveland	36	22	Wisconsin:		
Columbus		11	Fond du Lac		1
Dayton	2		Kenosha		1
East Cleveland	1		Madison		1
Lima		3	Racine		3
Lorain	1		Wausau	6	1
Mansfield		1	Wyoming:		
Norwood		1	Cheyenne		2
Sandusky	1				

POLIOMYELITIS (INFANTILE PARALYSIS).

The column headed "Median for previous years" gives the median number of cases reported during the corresponding weeks of the years 1915 to 1920, inclusive. For cities for which the information is not available for the full six years, as many years as possible are included.

Place.	Median for previous years.	Week ended Jan. 29, 1921.		Place.	Median for previous years.	Week ended Jan. 29, 1921.	
		Cases.	Deaths.			Cases.	Deaths.
Maryland:				Ohio:			
Baltimore	0	1		Alliance	0		1
Missouri:				Steubenville	0	1	
St. Louis	0	1		Utah:			
				Salt Lake City	0		1

RABIES IN ANIMALS.

Place.	Cases.	Deaths.
Massachusetts:		
Fall River	1	

CITY REPORTS FOR WEEK ENDED JAN. 29, 1921—Continued.

SCARLET FEVER.

See p. 318; also Telegraphic weekly reports from States, p. 305, and Monthly summaries by States, p. 309.

SMALLPOX.

The column headed "Median for previous years" gives the median number of cases reported during the corresponding weeks of the years 1915 to 1920, inclusive. For cities for which the information is not available for the full six years, as many years as possible are included.

Place.	Median for previous years.	Week ended Jan. 29, 1921.	
		Cases.	Deaths.
Alabama:			
Birmingham	2	10	
Mobile	0	2	1
Montgomery	0	6	
Arkansas:			
Fort Smith	0	1	
California:			
Alameda	0	2	
Los Angeles	1	3	
Oakland	0	6	
Sacramento	0	6	
San Bernardino	3	2	
San Diego	0	1	
San Francisco	0	44	
Stockton	0	1	
Colorado:			
Denver	14	24	
Greeley	0	1	
Pueblo	1	2	
District of Columbia:			
Washington	0	1	
Georgia:			
Atlanta	0	30	
Macon	0	3	
Savannah	0	1	
Illinois:			
Bloomington	1	10	
Centralia	0	3	
Chicago	1	9	
East St Louis	1	27	
Galesburg	0	10	
Kewanee	1	1	
Oak Park	0	1	
Pekin	9	4	
Rockford	0	37	
Rock Island	2	2	
Indiana:			
Crawfordsville		7	
Elkhart	0	6	
Evansville	2	4	
Fort Wayne	0	6	
Frankfort		1	
Gary	1	1	
Hammond	3	6	
Huntington	3	1	
Indianapolis	6	15	
La Fayette	0	2	
Logansport	2	1	
Marion	1	16	
Mishawaka	0	9	
South Bend	0	18	
Terre Haute	0	10	
Iowa:			
Cedar Rapids	2	11	
Council Bluffs	1	2	
Davenport	2	4	
Des Moines	2	13	
Dubuque	0	20	
Iowa City	0	1	
Marshalltown	7	2	
Mason City	3	2	
Muscatine	0	5	
Sioux City	3	41	
Kansas:			
Fort Scott	0	2	
Hutchinson	0	3	
Kansas City	1	3	
Parsons	0	2	
Salina		1	
Wichita	1	3	
Kentucky:			
Covington	0	1	
Lexington	0	4	
Louisville	1	2	
Paducah	5	2	
Louisiana:			
New Orleans	5	31	2
Maine:			
Waterville		1	
Michigan:			
Detroit	9	26	
Flint	7	6	
Grand Rapids	1	2	
Ishpeming	0	1	
Muskegon		3	
Pontiac	3	2	
Sault Ste. Marie	0	5	
Minnesota:			
Duluth	0	14	
Hibbing	0	1	
Mankato	1	5	
Minneapolis	20	194	
St. Cloud	2	5	
St. Paul	5	61	
Winona	0	4	
Missouri:			
Cape Girardeau	1	1	
Independence	1	4	
Kansas City	7	10	
St. Joseph	7	2	
St. Louis	2	41	
Montana:			
Billings	0	2	
Butte	2	1	
Great Falls	3	2	
Missoula	0	1	
Nebraska:			
Lincoln	7	6	
Omaha	13	25	
Nevada:			
Reno	1	1	
New York:			
New York	0	1	
North Carolina:			
Charlotte	0	3	
Winston-Salem	1	7	
North Dakota:			
Fargo	1	20	
Ohio:			
Akron	1	6	
Alliance	1	1	
Canton	0	8	
Cincinnati	0	6	
Cleveland	6	7	
Columbus	0	2	
Dayton	1	2	

CITY REPORTS FOR WEEK ENDED JAN. 29, 1921—Continued.

SMALLPOX—Continued.

Place.	Median for previous years.	Week ended Jan. 29, 1921. Cases.	Week ended Jan. 29, 1921. Deaths.
Ohio—Continued.			
Lima	0	4	
Lorain	0	6	
Middletown	1	2	
Sandusky	0	4	
Springfield	0	1	
Toledo	3	1	
Oklahoma:			
Oklahoma City	3	4	
Tulsa		3	
Oregon:			
Portland	2	17	
Pennsylvania:			
New Castle	0	1	
South Carolina:			
Charleston	0	11	
Columbia	0	3	
South Dakota:			
Sioux Falls	0	3	
Tennessee:			
Knoxville	1	2	
Memphis	6	1	
Nashville	0	3	
Texas:			
Beaumont	0	2	
Dallas	40	14	
Waco	1	7	
Utah:			
Salt Lake City	4	44	
Vermont:			
Rutland	0	1	
Washington:			
Aberdeen	0	1	
Everett	0	1	
Seattle	5	22	
Spokane	6	39	
Tacoma	0	5	
Vancouver	0	1	
West Virginia:			
Charleston	0	1	
Parkersburg	0	5	
Wisconsin:			
Beloit	0	1	
Eau Claire	0	1	
Green Bay	1	4	
LaCrosse	0	10	
Madison	1	8	
Manitowoc	0	1	
Marinette	0	10	
Milwaukee	5	17	
Racine	0	2	
Sheboygan		18	
Superior	0	6	

TETANUS.

Place.	Cases.	Deaths.
Alabama:		
Birmingham		1
Illinois:		
Danville	1	
Kansas:		
Coffeyville	1	1
Missouri:		
St. Joseph		1
New York:		
New York		1
Texas:		
Dallas		2

TUBERCULOSIS.

See p. 318; also Telegraphic weekly reports from States, p. 305.

CITY REPORTS FOR WEEK ENDED JAN. 29, 1921—Continued.

TYPHOID FEVER.

The column headed "Median for previous years" gives the median number of cases reported during the corresponding weeks of the years 1915 to 1920, inclusive. For cities for which the information is not available for the full six years, as many years as possible are included.

Place.	Median for previous years.	Week ended Jan. 29, 1921.	
		Cases.	Deaths.
Alabama:			
Birmingham	0	2	2
Arkansas:			
Fort Smith	0	1	
Little Rock	0	1	
California:			
Los Angeles	2	5	
Pasadena	0	1	
Sacramento	0	1	
San Francisco	2		1
Stockton	0		1
Colorado:			
Pueblo	0		1
Connecticut:			
Hartford	0	1	
District of Columbia:			
Washington	1	2	
Georgia:			
Savannah	0	4	
Illinois:			
Chicago	8	3	1
Rock Island	0		1
Indiana:			
East Chicago	0		1
Hammond	0		1
Indianapolis	1	2	1
Mishawaka	0	5	1
Muncie	0	1	
Kentucky:			
Covington	0	2	
Lexington	0	3	
Louisiana:			
New Orleans	2	1	
Maine:			
Portland	0	1	
Maryland:			
Baltimore	3	1	1
Cumberland	0	2	
Massachusetts:			
Arlington	0	1	
Boston	2	1	1
Haverhill	1	1	
New Bedford	0	1	
Pittsfield	0		1
Somerville	0	1	
Taunton	0	3	
Worcester	0	1	
Michigan:			
Detroit	2	1	
Port Huron	0	1	
Minnesota:			
Minneapolis	0	3	
St. Paul	0	1	
Missouri:			
St. Louis	3	1	
Montana:			
Great Falls	0	1	
New Jersey:			
Elizabeth	0	1	
Kearny	0	2	1
Plainfield	0	2	
New York:			
Buffalo	2	4	
Lackawanna	1	3	
Lockport	0	1	
New York	15	11	2
Schenectady	0	1	
Ohio:			
Akron	0	1	
Canton	0	2	
Cleveland	1	3	
Lima	0	2	
Newark	0	1	
Toledo	1	1	
Oklahoma:			
Tulsa		1	
Pennsylvania:			
Beaver Falls	0	1	
Harrisburg	0	1	
New Castle	0	2	
Philadelphia	5	1	
Reading	1	2	
Sharon	0	1	
Swissvale		1	
Tennessee:			
Nashville	0	1	
Texas:			
Dallas	0	3	
Galveston	2	2	
Vermont:			
Burlington	0	1	
Virginia:			
Alexandria	0	1	
Richmond	0	2	
West Virginia:			
Parkersburg	0	1	
Wheeling	2		1
Wisconsin:			
Marinette	0	1	
Sheboygan		3	

CITY REPORTS FOR WEEK ENDED JAN. 29, 1921—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS.

Place.	Population Jan. 1, 1920, subject to correction.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Alabama:										
Birmingham	178,270	44			11		4		3	2
Mobile	60,151	20	4							1
Montgomery	43,464	11	1							
Tuscaloosa	11,996		1		1					
Arizona:										
Tucson	20,292	10								5
Arkansas:										
Fort Smith	28,811		2		21		1			
Hot Springs	11,695	6							2	2
Little Rock	64,997		1		26		1			
North Little Rock	14,048	3			3					
California:										
Alameda	28,806	7			2		1			
Eureka	12,923	6					1			1
Long Beach	55,593	17			13		3		4	3
Los Angeles	576,673	165	51	2	170		8		108	9
Oakland	216,361	53	6		1		6		4	4
Pasadena	45,354		3		13		2		1	
Riverside	19,341	10	5		38					1
Sacramento	65,857	19	6				1		2	2
San Bernardino	18,721	8			3				3	2
San Diego	74,683	36			1				5	2
San Francisco	508,410	166	37	4	16		13		24	20
Santa Barbara	19,441	6					1		1	
Santa Cruz	10,917	2					1			
Stockton	40,296	16	1				1			1
Vallejo	21,107	5								
Colorado:										
Denver	256,369	77	20	1	77	2	16			16
Greeley	10,883						2			
Pueblo	42,908		9	1	5		7		5	
Connecticut:										
Bridgeport (town)[1]	143,538	37	14	3	2		7		5	2
Bristol (town)[1]	20,620	5	1						2	
Greenwich (town)	22,123		1						1	
Hartford (town)[1]	138,036	32	13		3		7		4	2
Manchester (town)	18,370	1			1		3			
Meriden (town)	34,739	2	2				7	1	1	1
New Haven (town)[1]	162,519	44	21	1	1		35		4	
New London (town)[1]	25,688	6							3	
Norwalk (town)[1]	27,700	10	8							
Norwich (city)	22,304	5	1						1	
Stamford (town)	40,057		1		1		9		7	
Delaware:										
Wilmington	110,168	48	3	1			5	1		7
District of Columbia:										
Washington	437,571	132	30	2	42		24		32	10
Georgia:										
Atlanta	200,616	62	2		2	3	2	2	1	4
Brunswick	14,413	2								
Macon	52,995	23	1				1			
Rome	13,252		2		1		3			
Savannah	83,252	31	1				1			3
Idaho:										
Boise	21,393	3	2		1		1			
Illinois:										
Alton	24,682	7	3				1			
Aurora	36,397	13							2	
Bloomington	28,725	7	1				5			
Centralia	12,491	0					2			
Chicago	2,701,705	718	218	12	185		200	3	182	53
Danville	33,750	7					4		1	
Decatur	43,818	9	11							
East St. Louis	66,740	19	4				7			1
Elgin	27,454	5	1		22		2			
Evanston	37,215	11	8		1		4		1	
Freeport	19,669	6							1	
Galesburg	23,834	5			9		2			
Jacksonville	15,713	15	4		19		8			2
Kewanee	16,026	6	5	3	4		17	1		1
La Salle	13,050	2								

[1] Coextensive with city of same name.

CITY REPORTS FOR WEEK ENDED JAN. 29, 1921—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

Place.	Population Jan. 1, 1920, subject to correction.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Illinois—Continued.										
Mattoon	13,552		1							
Oak Park	39,830	12	2		26		4	2	1	
Pekin	12,086						3			
Peoria	76,121	16	7	1			28		1	
Rockford	65,651	13	2		11		15			1
Rock Island	35,177	10	1				1		1	
Springfield	59,183	18					45			
Indiana:										
Bloomington	11,595	1	1				1			
Crawfordsville	10,139	4					6			
East Chicago	35,967	8								
Elkhart	24,277	5	1				7		2	
Evansville	85,264	22	5				3			
Fort Wayne	86,549	22	17		12	1	9	1		2
Frankfort	11,585	3					3			
Gary	55,378	16					1			1
Hammond	36,004	10					2		1	
Huntington	14,000	4			2		3			
Indianapolis	314,194	93	11	1	8		65	1	13	10
Kokomo	30,067	2								
La Fayette	22,486	4					1			1
Logansport	21,626	3					1			
Marion	23,747	11	2	1			3			1
Mishawaka	15,195	3	2				5			
Muncie	36,624	14			3		16			
Newcastle	14,458	1					1			
South Bend	70,983	8	1				3		2	1
Terre Haute	66,083	19			6		10		1	1
Iowa:										
Burlington	24,057	6			1		1			
Cedar Rapids	45,566		3				3			
Council Bluffs	36,162	9			1		8			
Davenport	56,727		1		1		5		1	
Des Moines	126,468		9		1		11			
Dubuque	39,141		1		1		8			
Fort Dodge	19,347	6								
Keokuk	14,423				4					
Mason City	20,065	4								1
Muscatine	16,068	7			1					1
Sioux City	71,227		1				5			
Kansas:										
Atchison	12,630	1	2						1	1
Coffeyville	13,452	1	2							
Fort Scott	10,693	5	9							
Hutchinson	23,298		5		5		6			
Kansas City	101,177		8		2		3		1	
Lawrence	12,456	8								
Leavenworth	16,912		5	1			2			
Parsons	16,028		2				1		1	
Salina	15,085	2			45					
Topeka	50,022	18	10	1	11		6		4	1
Wichita	72,128	26	14	1	1		10	1	5	
Kentucky:										
Covington	57,121	13	1		1		6		1	2
Lexington	41,534	20			1		11			3
Louisville	234,891	76	21	1			17		14	5
Paducah	24,735								1	
Louisiana:										
Alexandria	17,510	7	1						3	1
Baton Rouge	21,782	10	1		5		2		1	1
Lake Charles	13,088	2								
New Orleans	387,219	134	12		93		3		24	21
Maine:										
Auburn	16,985	6			16					
Bangor	25,978						2			
Biddeford	18,008				4					1
Lewiston	31,791	7	7		3				1	
Portland	69,272	24			11		6			2
Sanford	10,691	2								
Waterville	13,351		1		1					
Maryland:										
Baltimore	733,826	227	45	2	29		27		22	15
Cumberland	29,837	10			2		2	1	1	

CITY REPORTS FOR WEEK ENDED JAN. 29, 1921—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

Place.	Population Jan. 1, 1920, subject to correction.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Massachusetts:										
Adams	12,967	1	1				3			
Amesbury	10,035	0	2							
Arlington	18,665	6					1			1
Attleboro	19,731	3			1		5		1	2
Beverly	22,561	4								
Boston	748,060	217	73	4	70	1	51		62	16
Brockton	66,138	19	10	1			2		1	1
Brookline	37,748	6	4		2		3			
Cambridge	109,694	35	3		18	1	8		5	4
Chelsea	43,184	10	2		11		3		4	1
Chicopee	36,214	13							1	1
Clinton	12,979	7			6					
Danvers	11,108		1						1	1
Dedham	10,792	2								
Easthampton	11,261	1	1	1	1					
Everett	40,120	13	4		3		2		1	
Fall River	120,485	40	4	1	19	2	1		5	4
Gardner	16,971	3			1		2			1
Greenfield	15,462	2					5			
Haverhill	53,884	15	11		1		3		1	1
Holyoke	60,203	15	4	1			1			
Leominster	19,744	3			5				1	
Lowell	112,479	41	7	3	77		2		9	
Lynn	99,148	24	8		2		10		6	2
Malden	49,103	11	1		1		9		2	1
Medford	39,038	7	4	1	3					
Melrose	18,204	2	4				2			
Methuen	15,189	5	3	1			12		1	1
New Bedford	121,217	46	7		1		8		6	5
Newburyport	15,618	5	1				2			
Newton	46,054	14	3		5		1			
North Adams	22,282	7					1			
Northampton	21,951	12			7		1		2	2
Pittsfield	41,751	13	3		32		5	1	1	2
Plymouth	13,045	2								
Quincy	47,876	9	3							1
Salem	42,529	12			2				1	1
Saugus	10,874	2					2			
Somerville	93,091	22	7				8		2	1
Southbridge	14,245	2								
Springfield	129,563	20	6		2		16		1	2
Taunton	37,137		2		4		5		3	
Wakefield	13,025	3							2	
Waltham	30,915	6								
Watertown	21,457	3	3						2	
Westfield	18,604	8	1							
Winthrop	15,455	3			1		2		1	
Woburn	16,574	1								
Worcester	179,754	52	5	3	39		18		4	2
Michigan:										
Ann Arbor	19,516	10	8	1			7			
Benton Harbor	12,233	2					2			
Detroit	993,739	229	126	12	23		97	4	60	20
Flint	91,599	16	13		2		20			
Grand Rapids	137,634	41	3	1	1		17		7	
Holland	12,166	3								
Ironwood	15,739	1			10				1	
Ishpeming	10,500	2	2				1			
Kalamazoo	48,858	20					12		5	1
Marquette	12,718	5								
Muskegon	36,570	11	2				1			1
Pontiac	34,273	12	2				3			1
Port Huron	25,944	14	1		1		6			1
Saginaw	61,903	24	10	1	1		2		6	1
Sault Ste. Marie	12,096	3			3		4			
Minnesota:										
Duluth	98,917	16	2				8		2	
Hibbing	15,089		1							
Mankato	12,469	3								
Minneapolis	380,582	97	30	1	7		85	2	37	8
St. Cloud	15,873		2							
St. Paul	234,595	42	17		2		33		13	2
Winona	19,143						2			

CITY REPORTS FOR WEEK ENDED JAN. 29, 1921—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

Place.	Population Jan. 1, 1920, subject to correction.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Missouri:										
Cape Girardeau	10,252	5					3			
Independence	11,686	6	2		1		1			
Joplin	29,855		5				1		1	
Kansas City	324,410	92	19	2	49		9		6	7
St. Joseph	77,939	25	4	1	1		4			
St. Louis	772,897	209	128	6	23		68		25	13
Springfield	39,631	13								
Montana:										
Anaconda	11,668	1					3			
Billings	15,100	9	1		4					
Butte	41,611	19			8		2			1
Great Falls	24,121	9			55		2		2	
Missoula	12,668	2			8				2	
Nebraska:										
Lincoln	54,934	10			4		2			
Omaha	191,601	46	12	3	1		14			2
Nevada:										
Reno	12,016	1								
New Hampshire:										
Berlin	16,104	1					1			
Concord	22,167	11	1		2					
Dover	13,029	3			23		1			
Keene	11,210	3			1					
Manchester	78,384	25	9	1			3		4	3
Portsmouth	13,569						2			
New Jersey:										
Asbury Park	12,400	6	1						1	
Atlantic City	50,682	11	9				14	1		
Bayonne	76,754		4		1		10		2	
Belleville	15,660		1						1	
Bloomfield	22,019	2	2		1		7			
East Orange	50,710						5		4	
Elizabeth	95,682		6		1		5		5	1
Englewood	11,627	3	1				1			
Gloucester City	12,162								1	
Hackensack	17,667	11	10	3			2			1
Harrison	15,721		2	1					1	
Hoboken	68,166	20	6		3		1		1	3
Irvington	25,480				1		4		1	
Jersey City	297,864		31		10		19		9	
Kearny	26,724	4	3		6				1	1
Montclair	28,810	6			6		1		1	1
New Brunswick	32,779		5						1	
Orange	33,268	8	3		1		4		1	1
Passaic	63,824	11	6		15		6			3
Paterson	135,866		10		1		11		15	
Perth Amboy	41,707	9	2		5		2		1	
Phillipsburg	16,923	6	1	1						
Plainfield	27,700	6	1				1			1
Rahway	11,042	5	3				1			
Trenton	119,289	25	6		1		17	1	5	3
West Hoboken	40,068	2					2		2	
West Orange	15,573	1							1	
New York:										
Albany	113,344		3		16		3		10	
Buffalo	506,775	121	71	5	60	1	32	1	23	19
Cohoes	22,987	2	2	1						
Elmira	45,305	18								1
Geneva	14,648	0								
Glens Falls	16,638	2			31				4	
Hudson	11,745	4							1	
Ithaca	17,004	2			8				1	
Jamestown	38,917	7	4				4			
Lackawanna	17,918	5	1		5				2	
Lockport	21,308	2	2		3		5			1
Middletown	18,420	2			11		1		2	1
Mount Vernon	42,726	10	13		2		3			1
New York	5,621,151	1,490	460	29	108	7	550	16	[1] 307	[1] 109
Niagara Falls	50,760	15	12	1	17	5	25	1	1	
North Tonawanda	15,482	4	3	1	2					
Ogdensburg	14,609	8								
Olean	20,506	5								

[1] Pulmonary tuberculosis only.

CITY REPORTS FOR WEEK ENDED JAN. 29, 1921—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

Place.	Population Jan. 1, 1920, subject to correction.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
New York—Continued.										
Peekskill	15,868	4			10					1
Port Chester	16,573	6			1					
Poughkeepsie	35,000	13	4				3		1	1
Rochester	295,750	78	77	1	1		46		9	5
Rome	26,341		8		18		2			
Saratoga Springs	13,181	8			4				1	
Schnectady	88,723	19	13	1	12		1		3	1
Syracuse	171,717	48	19		36		27	1		5
Troy	72,013	22	3		125		2		3	2
Watervliet	16,073	4			13		2			
White Plains	21,031	4	3		2		1			
Yonkers	100,226	9	3		2		6			
North Carolina:										
Charlotte	46,338	15			81				5	2
Durham	21,719	9								
Greensboro	19,861	3								
Rocky Mount	12,742	9								
Wilmington	33,372	14			49		1		1	2
Winston-Salem	48,395	17			53		3		2	1
North Dakota:										
Fargo	21,961	8	1				2			
Ohio:										
Akron	208,435	25	9		7		14			
Alliance	21,603	7	4				1			
Barberton	18,811	5					1			
Canton	87,091	12	13				2			
Chillicothe	15,831	5	1		4		9			
Cincinnati	401,247	115	12		4		28		25	9
Cleveland	796,836		41	5	10	1	76	3	37	21
Columbus	237,031	78	14		3		16	2	5	6
Dayton	152,559	27	2		1		6		2	
East Cleveland	27,292		1						1	
Findlay	17,021	3					3			1
Fremont	12,468	3					2			
Ironton	14,007	4					6			1
Lancaster	14,706	3			3					
Lima	41,306	10			1		1			1
Lorain	37,295		6		8					
Mansfield	27,824	7							4	
Marion	27,891						2		1	
Middletown	23,594	8	1				1			
Newark	26,718	5					5		1	
New Philadelphia	10,718		1				2			
Norwood	24,966	4								
Sandusky	22,897	3	2		1				1	
Springfield	60,840	11	2		3		6		1	
Steubenville	28,508	7			3		2			
Tiffin	14,375	5					1			
Toledo	243,109	74	36	3	1		15		6	9
Zanesville	29,569	13							1	
Oklahoma:										
Oklahoma City	91,258	19	4				3			1
Tulsa	72,075		4		1		1			
Oregon:										
Portland	258,288	63	10	2	97		6		4	6
Pennsylvania:										
Allentown	73,502		7		22		18		1	
Altoona	60,331		6		3		1			
Ambridge	12,730				1					
Beaver Falls	12,802		1				1			
Bethlehem	50,358		3		12		23			
Braddock	20,879		1						1	
Bradford	15,525				4					
Butler	23,778		1		1		5		1	
Canonsburg	10,632						1		1	
Carbondale	18,640				2		1			
Carrick	10,504						1			
Chambersburg	13,171		2		6					
Chester	58,030		2				2			
Coatesville	14,515		1				10			
Columbia	10,836		1							
Connellsville	13,804		2				5			
Dickson City	11,049		1							

CITY REPORTS FOR WEEK ENDED JAN. 29, 1921—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

Place.	Population Jan. 1, 1920, subject to correction.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Pennsylvania—Continued.										
Donora	14,131		1		3		1		1	
Dubois	13,681		2		3		1			
Easton	33,813				9		6			
Erie	93,372		15		38		12		3	
Farrell	15,586				1		1			
Harrisburg	75,917		7		6		1			
Hazleton	32,277		2		1		4			
Homestead	20,452		4		2		3			
Johnstown	67,327		5		5		1			
Lancaster	53,150		15				3		1	
McKeesport	45,975		3		1					
McKee's Rocks	16,713				1					
Mahanoy City	15,599		2		5		1			
Meadville	14,568				15		12			
Monessen	18,179				3		2			
Mount Carmel	17,469		1		10					
Nanticoke	22,614				4					
New Castle	44,938		2				4			
New Kensington	11,987				1					
Norristown	32,319		4				5			
North Braddock	14,928		1		3					
Oil City	21,274		10		4					
Old Forge	12,237		1							
Olyphant	10,236								1	
Philadelphia	1,823,158	566	103	13	19		278	3	65	50
Phoenixville	10,484						3			
Pittsburgh	588,193		39		35		78		33	
Pittston	18,497		2		1		1			
Plymouth	16,500						1			
Pottsville	21,876		1							
Punxsutawney	10,311				2					
Reading	107,784		12		1		11		1	
Scranton	137,783		7		7		4			
Shamokin	21,204		1				3			
Sharon	21,747		1		2		1			
Shenandoah	24,726		2							
Sunbury	15,721		1				1		1	
Swissvale	10,908		1				3			
Tamaqua	12,363		2				10			
Uniontown	15,692				1		6			
Washington	21,480				1		2			
West Chester	11,717								1	
Wilkes-Barre	73,833		10		65		9		3	
Williamsport	36,198		3		3		6			
York	47,512		12		1		3			
Rhode Island:										
Cranston	29,407	5	4		2		4			
Newport	30,255	5					4			
Pawtucket	64,248	21	2				2			3
Providence	237,595	56	16	1	84		7			2
South Carolina:										
Charleston	67,957	26								3
Columbia	37,524		1		13		2		1	
Spartanburg	22,638	7			1					1
South Dakota:										
Sioux Falls	25,176	12					6			
Tennessee:										
Knoxville	77,818		1		2		4		2	2
Memphis	162,351	52	3		16				16	6
Nashville	118,342	40	3				6		4	6
Texas:										
Beaumont	40,422		1							
Corpus Christi	10,522	6							1	
Dallas	158,976	45	11	1	17	1	3		10	4
Galveston	44,255	10	3							2
Waco	38,500	19	1						2	1
Utah:										
Provo	10,303	11			10					
Salt Lake City	118,110	35	2		179	5	5			2
Vermont:										
Barre	10,008						2			
Burlington	22,779	10					3			
Rutland	14,951	3								

CITY REPORTS FOR WEEK ENDED JAN. 29, 1921—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

Place.	Population Jan. 1, 1920, subject to correction.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Virginia:										
Alexandria	18,060	5			6					
Danville	21,539		2							
Lynchburg	29,956	14	2						2	1
Norfolk	115,777		3		61		4		5	2
Petersburg	31,002	9			2		1		4	2
Richmond	171,667	49	6		9		2			9
Roanoke	50,842	19			19	1	1		1	
Washington:										
Aberdeen	15,337		1		2				2	
Seattle	315,652		19		5		9			
Spokane	104,437		6		7		2			
Tacoma	96,965		4				3			
Vancouver	12,637		1		8		5			
Walla Walla	15,503						2			
Yakima	18,539		1				2			
West Virginia:										
Bluefield	15,282				10		4			
Charleston	39,608	13	2		37		1			1
Fairmont	17,851		4				1			
Huntington	50,177	19	2							1
Martinsburg	12,515		1							
Morgantown	12,127	3	1							
Moundsville	10,669	3								
Parkersburg	20,050	6					2			
Wheeling	54,322	19	6		20	1	12		1	2
Wisconsin:										
Appleton	19,561						3			
Beloit	21,284	7	1							1
Fond du Lac	23,427	5	3							
Green Bay	31,017	3	2		1		5			
Janesville	18,293	7			2		2			1
Kenosha	40,472	4	5	1	1		2			
La Crosse	30,363						10			
Madison	38,378	5	1				13			
Manitowoc	17,563		1				1		1	
Marinette	13,610				6					
Milwaukee	457,147		44		11		55		27	
Oshkosh	33,162	6	1				1			
Racine	58,593	13	67	2			8			1
Sheboygan	30,955		1		1		1			
Superior	39,624	5			2		4			
Wausau	18,661	9					1		1	
Wyoming:										
Cheyenne	13,829	3			1					

FOREIGN AND INSULAR.

RAT PLAGUE ON VESSEL.

Steamship "Kronprinsessan Victoria"—Stockholm.

Rat plague was reported found on board the steamship *Kronprinsessan Victoria*, January 15, 1921, at Stockholm, Sweden. The vessel arrived from South America and had unloaded part of her cargo at Goteborg and Malmo, Sweden, before reaching Stockholm. On January 11, 1921, the *Kronprinsessan Victoria* left Malmo, and on unloading at Stockholm two dead rats were found, January 13. These rats showed, on preliminary examination, evidences of plague, and the vessel was sent to Fejan quarantine station near Goteborg, returning later to Stockholm. No infection was found in the crew.

The *Kronprinsessan Victoria* left Buenos Aires, Argentina, November 17, 1920.

TYPHUS FEVER ON VESSELS.

Steamships "Presidente Wilson" and "San Giusto"—New York.

The steamship *Presidente Wilson* from Trieste via Naples and Algiers, arrived at New York February 1, 1921, with three cases of typhus fever on board. To February 6 a total of 15 cases of typhus fever developed among persons arriving on the vessel. The *Presidente Wilson* left Trieste, Italy, January 15, 1921, Naples, January 18, and Algiers, January 22, 1921.

On February 10, 1921, the steamship *San Giusto* from Trieste and Naples, Italy, arrived at New York with 20 cases of typhus fever on board. The *San Giusto* left Trieste January 23 and Naples January 26, 1921.

CANADA.

Smallpox—Ottawa.

During the period December 26, 1920, to January 29, 1921, 341 cases of smallpox with one fatality were notified at Ottawa, Canada.

CUBA.

Communicable Diseases—Habana.

Communicable diseases have been notified at Habana as follows:

Disease.	Jan. 11-20, 1921. Cases.	Jan. 11-20, 1921. Deaths.	Remaining under treatment Jan. 20, 1921.
Chicken pox	3		11
Diphtheria	6		5
Leprosy	1		13
Malaria	123	2	[1] 143
Measles	35	1	25
Scarlet fever	3		4
Smallpox	6		[2] 9
Typhoid fever	27	6	[3] 57
Yellow fever	4		[4] 4

[1] From the interior, 72.
[2] From the interior, 4.
[3] From the interior, 31; from abroad, 4.
[4] From abroad 4, on the steamship *Saroia*, from Vera Cruz.

LIBERIA.

Monrovia Declared Free from Smallpox.[1]

On February 2, 1921, Monrovia, Liberia, was officially declared free from smallpox.

RUSSIA.

Cholera—Riga.

Cholera was reported present at Riga, Russia, January 22, 1921.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER.

Reports Received During Week Ended Feb. 18, 1921.[2]

CHOLERA.

Place.	Date.	Cases.	Deaths.	Remarks.
India				Nov. 7-13, 1920: Deaths, 1,284.
Bombay	Dec. 5-11	1	1	
Calcutta	Nov. 14-20	46	44	
Madras	Dec. 26-Jan. 1	1	1	
Rangoon	Dec. 5-25	5	5	
Philippine Islands:				
Manila	Dec. 19-25	1		
Provinces—				
Cagayan	Nov. 7-20	2	2	
Russia:				
Riga	Jan. 22			Present.

[1] Public Health Reports, Dec. 17, 1920, p. 3063.
[2] From medical officers of the Public Health Service, American consuls, and other sources.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received During Week Ended Feb. 18, 1921—Continued.

PLAGUE.

Place.	Date.	Cases.	Deaths.	Remarks.
Algeria:				
Algiers	Dec. 1-31	2	1	
Brazil:				
Bahia	Jan. 2-15	3	3	
India				Dec. 5-18, 1920: Cases, 4,852; deaths, 3,439.
Bombay	Dec. 5-11	2	2	
Calcutta	Nov. 14-20	46	44	
Karachi	Dec. 25-31	2	2	
Madras	Dec. 19-25	6	3	
Do	Dec. 26-Jan. 1	3	2	
Madras Presidency	Dec. 19-25	1,065	788	
Do	Dec. 26-Jan. 1	492	339	
Rangoon	Dec. 5-25	12	13	
On vessels:				
S. S. Kronprinessan Victoria.	Jan. 15			At Stockholm, Sweden. Rat plague found. Vessel left Buenos Aires, Argentina, Nov. 17, 1920. Stopped at Goteborg and Malmo, Sweden, Left Malmo, Jan. 11, 1921. Rats found dead, Jan. 13, 1921, at Stockholm.

SMALLPOX.

Place.	Date.	Cases.	Deaths.	Remarks.
Brazil:				
Bahia	Jan. 8-15	4		
Rio de Janeiro	Dec. 12-25	15	1	
Do	Dec. 26-Jan. 1	3	1	
Canada:				
Alberta—				
Calgary	Jan. 9-29	5		
Manitoba—				
Winnipeg	Jan. 16-29	7		
Ontario—				
Hamilton	Jan. 30-Feb. 5	2		
London	Jan. 23-29	2		
Montreal	do	4		
Ottawa	Jan. 23-Feb. 5	165		Total, Dec. 26, 1920-Feb. 5, 1921: Cases, 417; deaths, 1.
Toronto	Jan. 30-Feb. 5	6		
Saskatchewan—				
Regina	Jan. 23-29	1		
China:				
Amoy	Dec. 12-25	2		Dec. 5-11, 1920: Present.
Canton				Dec. 1-31, 1920: Prevalent.
Chungking	Dec. 12-25			Present.
Foochow	Nov. 28-Dec. 4			Do.
Hankow	Jan. 2-8	1	1	
Manchuria Province—				
Dairen	Dec. 7-20	5	1	
Do	Dec. 28-Jan. 10	24	4	
Nanking	Dec. 26-Jan. 4			Do.
Tientsin	Dec. 26-Jan. 1	241		In camp for famine refugees.
Colombia:				
Santa Marta	Jan. 16-22			Present.
Cuba:				
Antilla	Jan. 23-29	9		For Preston district.
Nuevitas	Jan. 24-30	2		
Dominican Republic:				
Santo Domingo	Jan. 9-15	3		
Ecuador:				
Guayaquil	Dec. 1-31	26	1	
Do	Jan. 1-15	12		
Egypt:				
Port Said	Nov. 19-25	1		
India				Nov. 7-13, 1920: Deaths, 121.
Bombay	Dec. 5-18	4	1	
Madras	Dec. 26-Jan. 1	2		
Rangoon	Dec. 12-25	3	1	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received During Week Ended Feb. 18, 1921—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Italy:				
Catania	Nov. 29-Dec. 5	1		In province, Nov. 29-Dec. 5, 1920: Cases, 32. Jan. 3-16, 1921: Cases, 32.
Messina Province	Jan. 3-9	9		Dec. 5, 1920-Jan. 2, 1921: Cases, 15.
Java:				
West Java				Dec. 9-15, 1920: Cases, 3; deaths, 2.
Batavia	Dec. 9-15	1		
Madeira:				
Funchal	Jan. 9-15		1	
Mexico:				
Mexico City	Dec. 19-25	3		
Morocco:				
Tangier	Dec. 26-Jan. 15			Prevalent in mild form among Moorish population. Two fatalities among Europeans.
Newfoundland:				
St. Johns	Jan. 22-26	1		
Panama:				
Colon	Jan. 19-25	29		Jan. 1-29, 1921: Cases, 45. Mild.
Portugal:				
Lisbon	Dec. 26-Jan. 8		7	
Portuguese East Africa:				
Lourenco Marques	Dec. 5-11	1		Reported present in interior of Chai-Chai district.
Russia:				
Siberia—				
Vladivostok	Nov. 1-30	1	1	
Tunis:				
Tunis	Jan. 8-14	3	2	
Turkey:				
Constantinople	Jan. 2-8	1		

TYPHUS FEVER.

Chile:				
Concepcion	Dec. 7-27		6	
Do	Dec. 28-Jan. 10		6	
Egypt:				
Cairo	Oct. 29-Nov. 25	11	7	
Great Britain:				
Belfast	Jan. 9-15	2		
Dublin	do	2		
Japan:				
Nagasaki	Dec. 27-Jan. 9	5	2	
Jugoslavia:				
Zagreb	Jan. 2-8	4	1	
Mexico:				
Mexico City	Dec. 19-25	12		Including municipalities in Federal district.
San Luis Potosi	Jan. 16-22			Present.
Turkey:				
Constantinople	Jan. 2-8	12		
On vessels:				
S. S. Presidente Wilson	Feb. 1-6	15		At New York. From Trieste, Italy, Jan. 15; Naples, Jan. 18; and Algiers, Jan. 22, 1921.
S. S. San Giusto	Feb. 10	20		At New York. From Trieste, Jan. 23, and Naples, Jan. 26, 1921.

YELLOW FEVER.

Mexico:				
Vera Cruz	Jan. 17-30	1	1	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received from Jan. 1 to Feb. 11, 1921.

CHOLERA.

Place.	Date.	Cases.	Deaths.	Remarks.
China:				
Canton	Nov. 1-30	7	6	
Changsha	Nov. 29			Present.
Chungking	do			Do.
Chosen (Korea)				Nov. 19-25, 1920: Deaths, 22. Aug. 1-Dec. 2, 1920: Cases, 24,017; deaths, 13,329.
India				Sept. 26-Oct. 9, 1920: Deaths, 2,672. Oct. 31-Nov. 6, 1920: Deaths, 1,142.
Calcutta	Oct. 31-Dec. 18	243	212	
Madras	Dec. 12-18	3	1	
Rangoon	Nov. 28-Dec. 4	4	3	
Indo-China				July 1-31, 1920: Cases, 136. Deaths, 98.
Japan:				
Taiwan Island (Formosa)	Nov. 11-Dec. 20	217	93	
Java:				
West Java				Oct. 29-Nov. 11, 1920: Cases, 2; deaths, 1.
Bandoeng	Oct. 29-Nov. 11	2	1	
Philippine Islands:				
Manila	Nov. 7-Dec. 18	8		
Provinces				Jan. 10-Oct. 30, 1920: Cases, 80; deaths, 51.
Cagayan	Oct. 3-Nov. 6	9	7	
Samar	Aug. 1-7	1	1	
Poland:				
Eastern frontier—				
Bialystok	Dec. 16			Present.
Grodno	do			Do.
Olitza	do			Do.
Posen	do			Present in Russian prison camp.
Stralkowo	do			Present.
Strelno	do	1	1	
Warsaw	do	5		
Siam:				
Bangkok	Oct. 9-Nov. 27	7	1	

PLAGUE.

Place.	Date.	Cases.	Deaths.	Remarks.
Algeria:				
Algiers	Nov. 1-30		1	Jan. 1, 1921: One fatal case.
Azores:				
St. Michaels				Total, Oct. 1-Dec. 10, 1920: Cases, 149; deaths, 49. In vicintiy of Ponta Delgada.
Barzil:				
Bahia	Oct. 31-Dec. 18	6	4	
Do	Dec. 26-Jan. 1	5	3	
Porto Alegre	Nov. 14-Dec. 11		3	
Pernambuco	Oct. 18-Nov. 14	9	1	
British East Africa				Outbreak, Nov. 8, 1920: Cases, 1,067.
Kenya Colony—				
Kisumu	Oct. 31-Nov. 27			Present.
Mombasa	do	1	1	
Nairobi	Oct. 31-Dec. 4	8	4	
Uganda	May 1-June 30	111	103	Entire protectorate.
Do	July 1-Nov. 5	259	63	Do.
Ceylon:				
Colombo	Nov. 7-Dec. 18	81	60	
Chile:				
Antofagasta	Nov. 24-Dec. 5	6	2	
Do	Dec. 27-Jan. 2	2		
China:				
Hongkong	Nov. 7-Dec. 11	5	5	
Manchuria	Dec. 15			On Chinese Eastern Railway Feb. 2, 1921.
Harbin		3		
Manchuria station			203	
Tsitsihar				Present.
Ecuador:				
Guayaquil	Nov. 16-Dec. 15	64	24	
Egypt				Jan. 1-Dec. 9, 1920: Cases, 461; deaths, 268.
Cities—				
Port Said	Oct. 22-28	1	1	
Suez	Nov. 18-27	10	3	
Provinces—				
Assiout	Nov. 24	3	2	
France:				
Marseille	June-Aug. 31	58	20	
Paris	June-Oct. 15	50	11	In suburbs, June-Nov. 2, 1920: Cases, 38; deaths, 19.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received from Ja . 1 to Feb. 11, 1921—Continued.

PLAGUE—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Great Britain:				
Dublin				1 case reported Dec. 15, 1920; date of occurrence, Oct. 18, 1920.
Liverpool				Plague-infected rat found, period Nov. 28-Dec. 11, 1920.
Greece:				
Kavala	Oct. 25-Nov. 7	2		
India				Oct. 24-Dec. 4, 1920: Cases, 15,187; deaths, 10,394.
Bombay	Nov. 28-Dec. 4	2	2	
Madras	Dec. 5-11	1	1	
Madras Presidency	Nov. 14-Dec. 18	3,281	2,203	
Rangoon	Oct. 31-Dec. 4	18	15	
Indo-China				July 1-31, 1920: Cases, 98; deaths, 71.
Mesopotamia:				
Bagdad	Oct. 1-31	25	7	
Mexico:				
Carbonera	Dec. 5-20	3	1	State of San Luis Potosi.
Do	Dec. 26-Jan. 1	2		
Cerritos	Dec. 5-20	7	8	Do.
Do	Dec. 26-Jan. 1	1		
Peru:				
Callao-Lima	Oct. 1-Nov. 30	6		
Trujillo-Salaverry	Dec. 27-Jan. 2	1		
Russia:				
Batum	Nov. 24-Dec. 3	38		Epidemic outbreak.
Straits Settlements:				
Singapore	Oct. 31-Nov. 6	1	1	
Tunis:				
Zarzis	Jan. 15	10		In military territory, South Tunis.
Turkey:				
Constantinople	Nov. 21-27	1	2	

SMALLPOX.

Place.	Date.	Cases.	Deaths.	Remarks.
Austria				Aug. 29-Nov. 6, 1920: Cases, 62.
Azores:				
Ponta Delgada	Dec. 18-24	7		
Bolivia:				
La Paz	Oct. 1-Nov. 30	11	3	
Brazil:				
Bahia	Oct. 31-Dec. 25	6		
Pernambuco	Oct. 18-Nov. 11	77	1	
Rio de Janeiro	Oct. 24-Dec. 11	93	23	
British East Africa:				
Uganda				May 1-June 30, 1920: Cases, 272.
Bulgaria:				
Sofia	Nov. 7-13	2		
Canada:				
Alberta—				
Calgary	Dec. 12-18	2		
Do	Jan. 2-8	1		
British Columbia—				
Vancouver	Dec. 5-11	1		
New Brunswick—				
Campbellton	Jan. 9-15			Present.
Restigouche County	Dec. 12-18	1		
Nova Scotia—				
Yarmouth	Jan. 2-29	2		
Ontario—				
Hamilton	Dec. 19-31	9		
Do	Jan. 2-29	28		
Kingston	Dec. 26-Jan. 8	8		
London	Jan. 2-15	8		
Montreal	Jan. 2-22	4		
Niagara Falls	Dec. 12-18	1		
North Bay	Dec. 12-25	4		
Do	Jan. 2-29	12		
Ottawa	Dec. 12-25	75	1	
Do	Dec. 26-Jan. 15	209		
Sault Ste. Marie	Sept. 15-Jan. 2-8	8		Present.
Toronto	Dec. 12-25	7		
Do	Dec. 26-Jan. 29	27		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received from Jan. 1 to Feb. 11, 1921—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Canada—Continued.				
Saskatchewan—				
Moose Jaw	Dec. 19-25	1		
Do	Jan. 2-22	3		
Regina	Dec. 12-25	11		
Do	Jan. 2-22	7		
Saskatoon	Dec. 16-22	20		
Do	Jan. 9-15	3		
Ceylon:				
Colombo	Nov. 21-Dec. 18	14	7	
China:				
Amoy	Nov. 7-Dec. 4		5	
Antung	Dec. 20-26	1		
Chungking	Nov. 7-Dec. 11			Present.
Foochow	Nov. 7-Dec. 25			Do.
Manchuria Province—				
Dairen	Nov. 16-Dec. 6	7	2	Jan. 18, 1921: Present.
Mukden	Dec. 12-18			Prevalent.
Nanking	Nov. 14-Dec. 18			Present.
Tientsin	Nov. 14-Dec. 4	2		Dec. 12-25, 1920: Cases, 160; at camp for famine refugees.
Tsinanfu	Oct. 31-Nov. 12	20		Statistics of Shantung Christian Hospital.
Chosen (Korea):				
Fusan	Nov. 1-30	1		
Colombia:				
Santa Marta	Dec. 5-25			Present.
Do	Dec. 26-Jan. 8			Do.
Cuba:				
Antilla	Dec. 7-27	10		For port of Preston.
Do	Jan. 2-22	21		Do.
Cienfuegos	Dec. 26-Jan. 8			Stated to be present in virulent form in Camaguey Province.
Habana	Dec. 31-Jan. 12	7		1 from Jatibonico, Cuba; 1 from Jamaica.
Nuevitas	Dec. 6-19	2		From Lugareno, a small station on railway, 16 miles distant, 1 case, week ended Dec. 12, 1920.
Do	Jan. 3-23	6		
Santiago	Nov. 29-Dec. 10	26		
Czechoslovakia				July 11-Aug. 14, 1920: Cases, 141; deaths, 29.
Danzig	Dec. 5-18	2		
Dominican Republic	Dec. 19-25	1		Nov. 15-Dec. 7, 1920: Cases, 8; occurring in 4 localities.
Ecuador:				
Guayaquil	Nov. 16-Dec. 15	21	2	
Egypt:				
Alexandria	Dec. 17-31	3	1	
Cairo	Oct. 1-7	1		
France:				
Paris	Nov. 1-30	2	1	
Rouen	Nov. 21-Dec. 31	7	2	
St. Etienne	Dec. 3-15	2	1	
Germany				Aug. 29-Nov. 6, 1920: Cases, 40.
Great Britain:				
Glasgow	Dec. 25	11	2	
Do	Jan. 2-15	5	3	
London	Dec. 26-Jan. 1	1		
Greece:				
Saloniki	Nov. 15-Dec. 26	39	14	In surrounding country, in other localities: Cases, 21; deaths, 2.
Do	Dec. 27-Jan. 2	13	9	
Haiti				Sept. 22, 1920-Jan. 8, 1921: Cases, 2,262; deaths, 64.
Port au Prince	Sept. 22-Dec. 2	486	2	In 8 interior towns, 20 cases. In 1 locality, 18 cases. In country district, vicinity of Port au Prince, cases numerous.
India				Sept. 26-Oct. 9, 1920: Deaths, 250.
Bombay	Nov. 7-Dec. 4	2	1	
Calcutta	Dec. 5-11	2	2	Oct. 31-Nov. 6, 1920: Deaths, 165.
Madras	Nov. 14-Dec. 18	7	5	
Rangoon	Nov. 21-Dec. 4	2		
Indo-China				July 1-21, 1920: Cases, 107; deaths, 24.
Italy:				
Catania	Dec. 20-26			In vicinity, 11 cases.
Do	Dec. 27-Jan. 2			In vicinity, 2 cases.
Palermo	Oct. 30-Dec. 10	306	97	
Java:				
West Java				Nov. 12-Dec. 1, 1920: Cases, 53; deaths, 4.
Batavia	Nov. 12-Dec. 1	6	1	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received from Jan. 1 to Feb. 11, 1921—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Jugoslavia	July 25-Aug. 28	128	42	Feb. 7-13, 1920: Cases, 122; deaths, 27.
Madeira:				
Funchal	Dec. 5-18		2	
Do	Dec. 26-Jan. 8		2	
Mesopotamia:				
Bagdad	Nov. 1-30	1		
Mexico:				
Chihuahua	Dec. 6-26	11	3	
Do	Dec. 27-Jan. 23		7	
Guadalajara	Dec. 1-31	1		
Mexico City	Nov. 14-Dec. 18	14		Including municipalities in the Federal district.
Tecate	Jan. 17	3		
Panama:				
Colon	Jan. 5-11	2		
Portugal:				
Lisbon	Nov. 28-Dec. 18		5	
Portuguese East Africa:				
Lourenco Marques	Oct. 24-Nov. 13	9		
Quelimane	do	3		
Russia:				
Reval	Oct. 1-31	3		
Riga	Nov. 1-7	5		
Siberia—				
Vladivostok	Oct. 1-31	1		
Spain:				
Barcelona	Nov. 18-Dec. 29		13	
Corunna	Dec. 12-18		1	
Madrid	Nov. 1-30		1	Sept. 1-30, 1920: Deaths, 2. Year ended Dec. 31, 1920: Deaths, 9.
Malaga	Oct. 1-Nov. 30		60	
Valencia	Dec. 5-25	3		
Do	Dec. 26-Jan. 8	4	1	
Syria:				
Aleppo	Nov. 14-Dec. 25			Present.
Tunis:				
Tunis	Nov. 30-Dec. 28	10	18	
Turkey:				
Constantinople	Nov. 21-Dec. 11	4		
Union of South Africa:				
Johannesburg	Oct. 1-31	1		
On vessels:				
S. S. Alfonso XIII	Dec. 27	1		At Habana, Cuba, from ports in northern Spain.
S. S. Cadiz	Jan. 5	1		At Habana, Cuba, from Mediterrean ports.
S. S. Ohioan	Jan. 4	1		At San Pedro, Calif., from New York, via Balboa, Canal Zone.

TYPHUS FEVER.

Place.	Date.	Cases.	Deaths.	Remarks.
Belgium:				
Ghent	Dec. 12-18	5		
Chile:				
Concepcion	Nov. 1-22		17	
Coquimbo	Dec. 1-7		1	
Valparaiso	Oct. 25-Nov. 27		13	
China:				
Manchuria (Province)—				
Harbin	Nov. 22-28	1		On Chinese Eastern Railway.
Manchuria Station	do	2		Do.
Czechoslovakia				July 11-Aug. 28, 1920: Cases, 138; deaths, 18.
Danzig	Dec. 20	1		In emigrant from Brest Litovsk; with 2 weeks' stay at Warsaw.
Egypt:				
Alexandria	Nov. 19-Dec. 31	13	6	
Cairo	Oct. 1-Dec. 28	21	11	
Germany				Sept. 12-Nov. 13, 1920: Cases, 69.
Great Britain:				
Belfast	Dec. 5-25	13		
Dublin	Nov. 28-Dec. 18	4	3	
Greece:				
Drama	Nov. 22-28	1	1	
Patras	Nov. 29-Dec. 5		1	
Saloniki	Oct. 25-Dec. 26	18	4	
Serres	Nov. 8-14	1		
Hungary				Aug. 3-Oct. 3, 1920: Cases, 9.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received from Jan. 1 to Feb. 11, 1921—Continued.

TYPHUS FEVER—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Japan:				
Nagasaki	Nov. 15-Dec. 26	10	1	
Jugoslavia	July 25-Aug. 28	27	5	Feb. 7-13, 1920: Cases, 84; deaths, 2. Dec. 12-25, 1920: Cases, 112.
Zagreb	Dec. 12-25	27		
Do	Dec. 26-Jan. 1	20	2	City and county.
Mesopotamia:				
Bagdad	Nov. 1-30	1	1	
Mexico:				
Guadalajara	Dec. 1-31		11	
Mexico City	Nov. 14-Dec. 18	55		Including municipalities in the Federal district.
San Luis Potosi	Dec. 5-31			Present.
Poland:				
Warsaw	Dec. 16	8		
Portugal:				
Oporto	Nov. 28-Dec. 4	1		
Do	Dec. 26-Jan. 1	3	1	
Russia:				
Reval	Sept. 1-Oct. 31	186		
Riga	Nov. 1-7	17		
Turkey:				
Constantinople	Nov. 21-Dec. 25	25	1	
Union of South Africa:				
Cape Town	Dec. 20-26	16	5	

YELLOW FEVER.

Place.	Date.	Cases.	Deaths.	Remarks.
Mexico:				
Orizaba	Dec. 5-18	2	1	
Papantla	do	8	2	
Tampico	Dec. 12-18	1	1	
Tuxpam	Dec. 5-18	9	4	
Do	Dec. 26-Jan. 1	5	1	
Vera Cruz	Dec. 5-26	8	3	
Do	Dec. 26-Jan. 16	2		
Zamora	Dec. 12-18	1	1	Also called Gutierrez. State of Vera Cruz.
Peru:				
Department—Lambayeque	Jan. 22			Outbreak.
On vessel:				
S. S. Savoia	Jan. 11-15	4		At Habana, Cuba, from Vera Cruz, Mexico. Vessel arrived Habana Jan. 10, 1921, with three cases sickness on board. Two cases confirmed. Two cases developed later on board; confirmed Jan. 15. Savoia left Vera Cruz Jan. 6, 1921.

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